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Military Operations
FORCE OPERATING CAPABILITIES

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Summary. The Force Operating Capabilities (FOC) contained herein are structured statements of operational capabilities which, when achieved in aggregate, fulfill the vision articulated in the Joint and Army Concepts as they apply to the Future Force.

Applicability. This pamphlet applies to Headquarters (HQ) TRADOC and its subordinate commands, centers, schools, and battlefield laboratories. It also guides other Army commands who determine, document, or are otherwise involved in warfighting requirements and Army staff elements who are involved in determining, documenting, and processing requirements. Force Operating Capabilities provide focus to the Army's Science and Technology Master Plan (ASTMP) and warfighting experimentation. They apply to tomorrow's Army, conducting overmatching decisive operations on the Information Age battlefield, and beyond.

Suggested improvements. The proponent for this pamphlet is the TRADOC Futures Center. Send comments and suggested improvements on Department of the Army (DA) Form 2028 (Recommended Changes to Publications and Blank Forms) through channels to Commander, TRADOC, ATTN: ATFC-DS, 10 Whistler Lane, Fort Monroe, VA 23651-1046. Suggested improvements may also be submitted using DA Form 1045 (Army Ideas for Excellence Program (AIEP) Proposal).

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Chapter 1
Introduction

1-1. Purpose. This pamphlet describes Force Operating Capabilities (FOC) desired for the Army near, mid and long term, encompassing the full spectrum of military operations, derived from analysis of joint concepts, Army Future Force concepts, and other documents developed in support of National Military Strategy (NMS), Strategic Planning Guidance (SPG), Army Strategic Planning Guidance (ASPG), the Army Transformation Road Map (ATR), and the Army Campaign Plan (ACP). This pamphlet informs the Capabilities Integration and Development System (JCIDS) process.

1-2. References. Appendix A contains a list of documents that influenced the collective development of all FOC, and this publication.

1-3. Explanation of abbreviations and terms. Abbreviations and terms used in this pamphlet are explained in the glossary.

1-4. Reviews. This pamphlet will be reviewed and updated on a biennial basis.

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Chapter 2
General

2-1. Overview.

a. Security Challenges. The scope of potential challenges is daunting. *Traditional* adversaries will continue to possess significant conventional land, sea, and air forces. In the face of United States (U.S.) overmatching conventional capabilities, some adversaries will adopt *irregular*, unconventional methods. Weapons of mass destruction (WMD) in the hands of traditional or irregular adversaries pose potentially *catastrophic* threats. The U.S. cannot, moreover, ignore the possibility of *disruptive*, breakthrough technologies that counter its capabilities or marginalize its power. The U.S. may indeed face all of these challenges, at one time, in one place. We cannot easily parse these threats, but rather must expect to encounter them in adaptive, seamless combinations.

b**.** Force Operating Capabilities (FOC) are developed thru analysis of joint as well as Army concepts. The joint campaign framework provides the foundation for everything we do. Given the nature of the security environment, sustained operational commitments and challenges inherent in responsively implementing the Defense Strategy, joint interdependence is a strategic and operational imperative. Joint interdependence is the *purposeful reliance* on other Service and joint capabilities to maximize their complementary and reinforcing effects, while minimizing service vulnerabilities in order to achieve the mission requirements of the Joint Force Commander.

c. The Army has conducted a strategic mission analysis to identify aspects of the Joint Campaign for which our land power contributions must be optimized. The result is a number of strategic objectives that collectively describe how we will increase our relevance to Joint Forces and our readiness to prevail in a Joint campaign. The strategic objectives fall into two basic categories relative to the Joint Force commander's campaign: those that contribute to particular operational requirements and those that are necessary functional enablers. The Army will work to improve its capability to conduct operations in support of Homeland Defense and Civil Support and Stability Operations as well as improving its capabilities against irregular challenges. The Army will also pursue functional improvements that span all phases of the typical campaign; Battle Command, Joint Logistics and Global Posture. Underpinning all of these efforts, the Army will continue to implement modularity and ensure that it is balancing risk.

d. Tremendous strides have been made over the past year in the design of and conversion to the Future Force, including mid-term modular force initiatives, but there is more to do. We must follow through with the implementation of necessary joint and Army functional enablers. The joint functional architecture consists of Joint Force Command and Control, Battlespace Awareness, Force Application, Protection, and Focused Logistics. The Army is developing a parallel and consistent functional structure of Command, See, Strike, Protect, Move, and Sustain. Future revisions of this pamphlet will reflect the new Army functional architecture. Additionally, Global Posture, Strategic Responsiveness, and Modularity related capabilities are required**.**

e. Modularity is essential because it increases Army lethality, full spectrum operational capability and responsiveness. It also contributes fundamentally to the Army's requisite expeditionary quality. To provide Combatant Commanders with the relevant and ready land power needed to win the War on Terrorism, the Army must ensure the complete and aggressive implementation of modularity in the Active and Reserve components. Resources are finite. The guiding principle is that the Army will not compromise the quality and capabilities required to field relevant and ready units.

2-2. FOC Definition. FOC are a grouping of advanced warfighting capabilities required by the Army to fulfill Future Force Concepts, described in relevant operational and measurable terms, embedded in the future joint operational environment.

2-3. FOC Format. See Appendix B.

2-4. FOC Organization and Concept Linkage. FOC are organized in the areas listed below. Each FOC write-up includes a linkage with the appropriate joint and Army concept areas, which are also listed below. The FOC identify what is needed to transition the Future Force concept key ideas into force capabilities.

    a. **FOC areas:**

- Battle Command.
- Battlespace Awareness.
- Mounted/Dismounted Maneuver
- Air Maneuver.
- LOS/BLOS/NLOS Lethality.
- Maneuver Support.
- Protection.
- Strategic Responsiveness and Deployability.
- Maneuver Sustainment.
- Training, Leader Development and Education.
- Human Engineering.

    b. **FOC – Concept Linkage.**

(1) Concepts define required capabilities. Force Operating Capabilities are derived from both Joint and Army concepts. The joint concepts, beginning with the Joint Capstone Concept *Joint Operations Concepts (JOpsC)* and including the Joint Operating Concepts (JOCs), Joint Functional Concepts (JFCs) and Joint Integrating Concepts (JICs) identify joint force capabilities required to prosecute a certain type of operation or to bring about a certain effect. Those required capabilities are then characterized with more clarity by the Services, in this case the Army, to create the force(s) required for joint, full-spectrum operations.

(2) The FOCs themselves are also interdependent. For maneuver forces to operate, they must have integrated C2, BA, fires, protection, and sustainment. Sustainment forces must have force protection that may require maneuver forces, including aviation, and support from other sustainment forces to provide maneuver sustainment effectively. No one can operate independently in the future operational environment. The nature of the joint operation may also require interdependence of the joint force—depending on another member of the joint force to provide a capability that may previously have been provided by the parent Service.

(3) FOCs also reinforce capabilities required by other Services to meet their Title X functions that support the Army. For the Army to provide the Land Component of a joint force requires the Air Force and Navy to fulfill their Title X responsibilities to transport the Army to the joint area of operation (JOA). To meet that requirement, the Air Force and Navy needs to know what they need to be able to transport. The Air Force may find they have a requirement for a new airframe because the existing fleet cannot accommodate the Army's future combat vehicle(s); it may not yet be feasible to design a land combat vehicle that has the desired level of armor protection and is light enough to be transported by Air Force tactical airlifters. So the Army, in developing a future combat vehicle that is inherently survivable, may identify that the Air Force needs a new airlift capability or that the Navy needs a better, faster sealift capability.

   c. FOC - Joint Functional Concept Linkage. Shown below is linkage between the Joint Functional Concepts and the FOCs. The major bullets are the JFC and the sub-bullets are the FOC.

- Joint Command and Control/ Net-Centric Operations.
  - Battle Command.
- Battlespace Awareness.
  - Battlespace Awareness.
- Force Application.
  - Mounted/Dismounted Maneuver.
  - Air Maneuver.
  - LOS/BLOS/NLOS Lethality.
  - Maneuver Support.
- Protection.
  - Protection.
- Focused Logistics.
  - Strategic Responsiveness and Deployability.
  - Maneuver Sustainment.
- Training.
  - Training, Leader Development and Education.

- Force Management.

Human Engineering has no direct link with any specific JFC; however, the Human Engineering capabilities identified indirectly link all concepts with the human-machine interface.

d. Army Concepts. Below is the Army Concept Strategy (ACS) architecture approved as the implementation guidance for the concept development pathway of the Army Concept Development and Experimentation Plan (ACDEP). Approved concepts such as Unit of Employment, Unit of Action, Maneuver Support, Fires and Effects, Air and Missile Defense, Maneuver Sustainment and others remain valid conceptual underpinnings for FOCs. The ACS-directed concepts under development are envisioned to enhance and clarify required capabilities established in the current suit of concepts. Consequently, the FOCs identified in this pamphlet provide a consistent developmental pathway toward the achievement of required Future Force capabilities.

(1) Operating Concepts.

- Operational Maneuver.
- Tactical Maneuver.

(2) Functional Concepts.

- Command.
- See.
- Move.
- Strike.
- Protect.
- Sustain.

2-5. Role of FOC in the Joint Capability Integration and Development System (JCIDS) process.

a. Force Operating Capabilities address the pursuit of advanced warfighting capabilities for the full spectrum of operations and describe them in relevant operational terms. Capability shortfalls are identified separately through the Capabilities Needs Assessment (CNA), - Army CIDS, and JCIDS processes. Inherent in the Future Force operational concepts is a full consideration of the joint operational environment (JOE). Each FOC includes a detailed, stand-alone narrative of the capability's utility on the current and future battlefield.

b. In the JCIDS process, FOCs are linked to Functional Capabilities Boards. The Functional Capabilities Boards ensures that the supporting analysis adequately leverages the expertise of the DoD Components, in particular, the Services, combatant commands, agencies, DoD laboratories, science and technology community initiatives, experimentation initiatives, non-DoD agencies and industry to identify promising materiel and nonmateriel approaches. It also, in conjunction with the FOC, drives the development and acquisition of new military capabilities through changes in doctrine, organization, training, materiel, leadership development and education,

personnel and facilities (DOTMLPF). Figure 1 illustrates the linkage between the FOC and the Functional Capabilities Boards.

JCIDS – FOC Linkage

JFC: Joint Functional Concept
FOC: Force Operating Capability
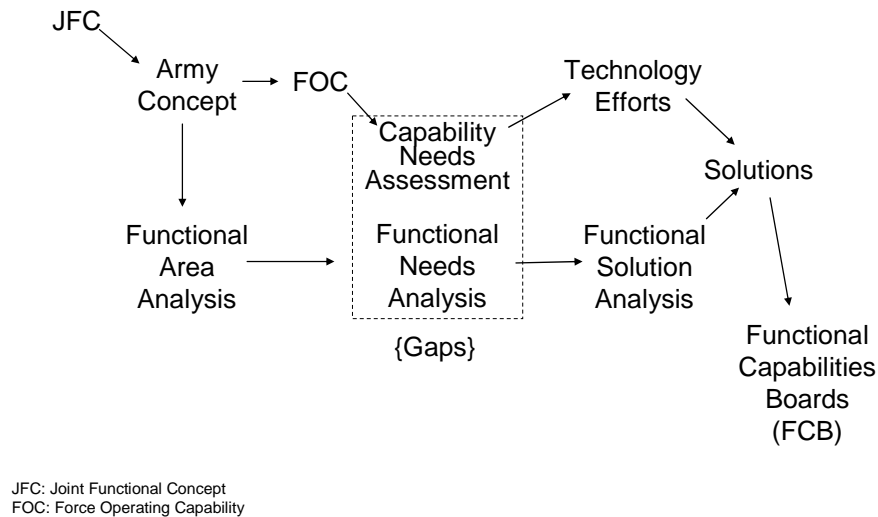
Figure 1. Concept-FOC-Functional Capabilities Boards Linkage

c. The JCIDS process will aid and support decision makers to ensure that validated capabilities needs for winning the current war and transforming the force are being addressed by appropriate materiel and/or nonmaterial approaches. It will also ensure that multiple materiel approaches or concepts, across the spectrum of DOTMLPF and across DoD Components, are adequately considered to provide desired capabilities.

d. Applications.

(1) Force Operating Capabilities form the basis for analysis for concept-based Future Force requirements across the full range of military operations required of the joint force commander.

(2) Force Operating Capabilities drive organizational and functional structure changes, through the Force Design Update process, as the institution of the Army transforms to the Future Force.

(3) Force Operating Capabilities also enable the achievement of Future Force capabilities into the current force as soon as practical. They will provide the basis for technological solutions in the near term and inform concept development and experimentation for the Future Force. Force Operating Capabilities encompass the full range of DOTMLPF solutions and assist in the development/integration of Future to Current, Current to Future, and Current to Current capabilities.

(4) Force Operating Capabilities validate requirements for the Army Science and Technology. They are employed by TRADOC leadership in the conduct of science and technology (S&T) assessment reviews, Special Access Program reviews, Army Technology Objective (ATO) candidate assessments, Advanced Technology Demonstration (ATD) candidate assessments, Army Science and Technology Work Group processes, and the Army Science and Technology Advisory Group process. Force Operating Capabilities assist in focusing the Army's S&T investment in support of Future Force overall development and Army transformation.

(5) Advanced Technology Demonstrations address selected high priority FOC, and demonstrate a capability that does not currently exist. They are resource intensive, and provide the medium to conduct troop interaction with mature technologies. The ATD Plan is jointly developed between TRADOC and ASA (ALT) with measures of effectiveness established to successfully execute the ATD. Advanced Technology Demonstration management plans are briefed to a council of colonels, and approved at the Army Science and Technology Working Group.

(6) All operational requirements described in the FOC derive from joint and Army concepts and Army Lessons Learned. Analyses of all FOC are used to describe changes in the various DOTMLPF domains, as the Army seeks to achieve Future Force capabilities required to support the joint force commander over the next 15 to 20 years.

(7) Materiel developers and industry use FOC as a reference, to maintain responsiveness and viability in independent research and development (R&D).

(8) Force Operating Capabilities are used in the Army Science and Technology Master Plan (ASTMP) process to provide warfighting influence upon technology base funding.

(9) Force Operating Capabilities are employed in the ATO process and serve as the building blocks that measure warfighting relevance. Candidate efforts selected as ATO are published in the ASTMP as the 200 most important S&T objectives for the Army R&D community. The ATO review provides the basis for the construct of ATD. The ATO receive senior Army leadership oversight, and have priority for fiscal resourcing.

(10) Affordability is not specifically addressed by the FOC; however, affordability is inherently considered within the Functional Solution Analysis of the Joint Capabilities Integration and Development System, and integral to eventual acquisition decisions.

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Chapter 3
Joint Operational Environment—an Overview

3-1. Strategic Environment Summary. *Traditional* adversaries will continue to possess significant conventional land, sea, and air forces. In the face of United States (U.S.) overmatching conventional capabilities, some adversaries will adopt *irregular*, unconventional methods. The WMD in the hands of traditional or irregular adversaries pose potentially *catastrophic* threats. The U.S. cannot, moreover, ignore the possibility of *disruptive*, breakthrough technologies that counter its capabilities or marginalize its power. The U.S. may indeed face all of these challenges, at one time, in one place. We cannot easily parse these threats, but rather must expect to encounter them in adaptive, seamless combinations.

3-2. Potential Threats. Opponents will attempt to counter American strengths by attacking or exploiting perceived weaknesses, especially our requirement for points of access into theater, sustainment base(s), transportation assets and our dependence on command, control, communications, and computers (C4), along with intelligence, surveillance, and reconnaissance (ISR), so vital to the U.S. synergistic, system-of-systems approach to warfare. They will employ Special Purpose Forces (SPF), long-range strike, niche technology upgrades, weapons of mass effects (WME), and information operations.

3.3. Social and Cultural Impact. The march of Globalization and the continuing maturation of the information age have served to increase both the likelihood and intensity of conflict between societies and cultures. Prejudices acquired through exposure to vast amounts of information will aggravate the natural friction that occurs when societies and cultures with differing beliefs, values, and behavior interact. The interaction itself does not necessarily result in conflict. It is the inability or unwillingness of either side or both to understand and accept the differences that lead to conflict. The same tools of the information age can, however, can be used to shape the operational environment in a manner that fosters a non-confrontational interaction. Information and knowledge can lead to a general sensitivity to the conflict of cultures, and the understanding of specific societies and cultures that result in true cultural awareness. As Globalization increases the pace at which cultures meet, it is incumbent upon us to use these same tools to anticipate and mitigate the resulting friction. The interaction of different cultures is inevitable. The conflict that may result is not.

3-4. Science and Technology Impact. The pace of revolution in science, technology and engineering (ST&E) development is expected to accelerate during the next two decades. This rapid rate of change will remain the hallmark distinction of ST&E for the foreseeable future as innovative discovery continues within fields. The world of ST&E can be divided into four major subject areas: biological systems; machines and computers; information, knowledge, and communications; and energy. The connections or fault lines between these four broad discussion areas hold the most interesting insights for a military force that is anticipating the future operational environment. Advances in ST&E will provide significant improvements to many aspects of the future way of life. Militarily, they will provide technology that can be used against the U.S.

3-5. Summary. Adversaries will attack America's ability to maintain positive relationships with host nations, the media, and multinational or interagency partners. If tactical success is out of

reach, adversaries will seek to preserve their military forces, particularly ground forces, while conducting strategic operations to degrade U.S. national will, fracture its alliances and coalitions, and limit the scope of American involvement. In short, the Joint Operational Environment will present a formidable and challenging set of demands on the Nation that must be considered today.

3-6. Complete Joint Operational Environment Assessment. A detailed analysis of the Joint Operational Environment can be found at https://www.us.army.mil/suite/doc/1482780.

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Chapter 4
Force Operating Capabilities

Section I – Battle Command

> Battle Command is the art and science of applying leadership and decision-making to achieve mission success. Future Force battle command will enable other advances in the Future Force, such as improvements in responsiveness, lethality, survivability, and mobility, to achieve a new way of operating, based on knowledge superior to that of our adversaries. Battle command construct will provide Future Force leaders with the following capabilities:
>
> - Effective, layered and integrated Command and Control for Joint, multinational, and interagency operations that operate while on the move.
>
> - A single, integrated tactical network with universal, world-wide accessibility to the Global Information Grid (GIG).
>
> - Networked force that is optimized for mobile operations through dynamic, extended range, self-organizing and multilayered communications.
>
> - Decision and Planning Support capabilities that cover all functions including deployment, mission rehearsal, sustainment, ISR, etc, en route as well from fixed locations.
>
> - Information Operations integrated with Information Management (IM) and Intelligence, Surveillance, and Reconnaissance (ISR) that support the Future Force achieving Information Superiority (IS).
>
> - Information Protection that enables the Future Force to guard communications, networks and computers, and rapidly restore information or information systems if compromised, corrupted or destroyed.

4-1. Joint/Army Concepts Linkage.

   a. Joint and Army concepts establish the required capabilities for the joint force and Army future Force out to 15 to 20 years into the future. The Army Future Force will be a strategically responsive, campaign quality force, dominant across the range of military operations and fully integrated within the joint, interagency, and multinational security framework. It will provide sustained land combat power to future joint operations, responding effectively and seamlessly to any conflict, regardless of character or scale. The full spectrum quality of the Future Force will address the diverse threats and the volatile conditions expected to characterize the future operating environment through the adaptive combination of seven key operational ideas:

      • **Shaping and Entry Operations** shape regional security conditions, and – if forces are committed – shape the battlespace, help seize the initiative, and set conditions for decisive

maneuver throughout the campaign. Use of multiple entry points will help overcome enemy anti-access actions, enhance surprise, reduce predictability, and— through the conduct of immediate operations after arrival—produce multiple dilemmas for the enemy.

• **Operational Maneuver from Strategic Distances** to a crisis theater will enable the force to deter or promptly engage an enemy from positions of advantage. Employing advanced joint lift platforms not dependent on improved ports, the Future Force will deploy modular, scaleable combined arms formations in mission-tailored force capability packages, along simultaneous force flows, to increase deployment momentum and close the gap between early entry and follow-on campaign forces.

• **Intratheater Operational Maneuver** by ground, sea, and air will extend the reach of the joint force commander, expand capability to exploit opportunities, and generate dislocating and disintegrating effects.

• Once the Future Force seizes the initiative, it combines its multidimensional capabilities in **Decisive Maneuver** to achieve campaign objectives: *Simultaneous, distributed operations* within a noncontiguous battlefield framework enable the Future Force to act throughout the enemy's dispositions to achieve dislocating and disintegrating effects.

o *Continuous operations and controlled operational tempo* will overwhelm the enemy's capability to respond effectively, resulting in physical destruction and psychological exhaustion at a pace not achievable today.

o *Direct attack of key enemy capabilities and centers of gravity* with strike and maneuver will accelerate the disintegration of the enemy operational integrity.

• The Future Force also conducts **Concurrent and Subsequent Stability Operations**, the former to secure and perpetuate the results of decisive maneuver *during* the campaign, and the latter to "Win the Peace" once they defeat enemy military forces, to ensure long term resolution of the sources of conflict.

• **Distributed Support and Sustainment** will maintain freedom of action and provide continuous sustainment of committed forces in all phases of operations, throughout the battlespace, and with the smallest feasible deployed logistical footprint.

• Throughout the future campaign, **Network-Enabled Battle Command** will facilitate the situational understanding needed for the self-synchronization and effective application of Joint and Army combat capabilities in any form of operation.

Three core concepts—the Army capstone concept "Army in Joint Operations" (TP 525-3-0), the Unit of Employment Concept (TP 525-3-92), and the Maneuver Unit of Action Concept (TP 525-3-90) —comprise the conceptual foundation for Future Force operations at the strategic, operational, and tactical levels, respectively. As a body, the Future Force concepts account for the emerging joint framework and support Future Force development from the foundational perspective FF maneuver warfare.

b. Battle Command is the art and science of applying leadership and decision-making to achieve mission success. Battle Command will enable other advances in the current force and the future force, such as improvements in responsiveness, lethality, survivability, and mobility, to achieve a new way of operating, based on knowledge superior to that of our adversaries. This knowledge-based approach is not better attrition warfare, but rather, a new way of war. It is about getting the right force, at the right time, to the point of decision, in a much more efficient and effective way than achieved before. Battle Command requires emphasis, on both leadership and decision-making, to enable the combined arms commander to fight effectively. The characteristics of Battle Command are stated in the following '10 big ideas':

(1) <u>Commander-Driven, Purpose-Oriented, Knowledge-Based Mission Orders</u>. Very high tempo, widely distributed dynamic, full-spectrum operations, in a complex environment, will overwhelm any leader or system that attempts to centrally control execution. Decentralized execution by all arms becomes mandatory. Maximum initiative, within commanders' intent, will allow application of combined arms, at the tempo envisioned.

(2) <u>Echelonment of Command is not the same as Echelonment of Unit Formation</u>. The completely flexible tailoring of forces is central to combined arms warfare and dominant maneuver. The appropriate mix of Battle Command, maneuver, maneuver sustainment, and maneuver support is mission dependent, and not tied to organizational convenience.

(3) <u>Battle Command Resourced for Sustained Operations</u>. The Battle Command System (BCS) must be structured and resourced for the long haul, in terms of distance and duration.

(4) <u>Battle Command—Anytime, Anywhere</u>. High tempo, fluid maneuver, from strategic distance, will require the commander to exert personal presence, at the points of decision, across vast areas. The BCS must allow commanders to move and command effectively, from alert, through redeployment, from whatever location the circumstances require.

(5) <u>Teaming Commanders and Leaders—On Demand Collaboration</u>. Distributed operations and high tempo maneuver will demand rapid synchronization, swift adaptation of plans and control measures, flexible groupings of distributed staff elements, and direct exchanges between commanders across hierarchies.

(6) <u>Fully Integrated: Space to Mud</u>. Joint interdependence demands that Army Forces (ARFOR) dominate maneuver, execute precision fires, efficiently support Army and joint elements, and provide full dimensional protection. Army combined arms will complement and reinforce each other, and other joint elements, throughout the campaign. The BCS will become the catalyst for effective multinational operations.

(7) <u>One Battle Command System</u>. A unitary BCS empowers tactical commanders to execute combined arms maneuver more effectively than any in history. The same system that controls wartime operations will regulate activities in garrison, and in training. Because the BCS is part of the joint system, ARFOR will support, and be supported by, joint elements.

(8) <u>Unprecedented Information Network Dependability</u>. A multi-tiered network will allow combat arms, combat support, and combat service support commanders to reach across tactical boundaries, and across theater and intercontinental distances, to access and share actionable information. The system will allow humans to apply judgment and experience, exploiting vast amounts of information, managed more effectively. The network will tie global maneuver, maneuver support, and maneuver sustainment, and provide redundancy and security to protect it.

(9) <u>Modular, Scaleable, Tailored Battle Command</u>. Highly tailored and responsive ARFOR will require Battle Command, matched and positioned precisely, for theater needs. Just as ARFOR are task organized, the BCS will constantly adapt, move, expand, and contract in size, and adjust capability, as the situation demands.

(10) <u>Dramatically Smaller Deployed Footprint</u>. The pace and scope of maneuver, in and outside the theater, mandates a BCS that is equally maneuverable. A stretch goal to make the BCS much more tactically, operationally, and strategically responsive is to reduce the footprint of command posts (CPs) at unit of action (UA) level, as well as higher echelon levels, by a factor of ten.

c. The Battle Command System (BCS) requires tailorable, highly deployable CPs, which are resourced for sustained operations. The BCS enables the commander to exercise leadership and decision-making from anywhere, at anytime, and permits commander, leaders, and staffs to collaborate on mission orders, on demand. The BCS is one system of Battle Command, vice an aggregation of stovepipes. The BCS must be fully integrated from theater, to operational, to tactical, and across all of the traditional battlefield functional areas (BFAs). Battle Command Construct is enabled by ultra-reliable and redundant communications that are modular, scaleable, and tailorable. A desired characteristic of the BCS is to have a dramatically smaller deployment footprint than is currently employed. The BCS will be interoperable with joint, national, and multinational command and control (C2) infrastructures, enabling the Future Force to integrate joint and combined military operations. Information systems (INFOSYS) for Future Force combat systems must support the simultaneous, multimodal insertion of UA forces into multiple austere points of entry, without reliance on fixed ports and staging bases.

4-2. Desired Battle Command Capabilities.

a. Capabilities envisioned for Battle Command are grouped into the following capability areas:

- Command and Control.

- Army Client to the Global Information Grid.

- Network Operations.

- Decision and Planning Support.

- Information Operations.

- Information Protection (See <u>Protection</u>).

b. The Deployment and Planning and Execution Tools FOC was identified as Battle Command capabilities necessary to support the Strategic Responsiveness and Deployability FOC area but are discussed here as they directly impact Battle Command.

4-3. FOC-01-01: Command and Control

a. Capstone Capabilities. The Future Force Army Operational-level HQ, the Future Force Unit of Employment (UE), is capable of C2 of all Army, joint, and multinational forces. It will be organized, designed, and equipped to fulfill C2 functions as the ARFOR component, Combine and/or Joint Force Land Component Command (CJFLCC) HQ, or the Joint Task Force (JTF) HQ. The UE are the basis of combined arms air-ground task forces. Future Force Army Operational-level HQ will also have the inherent capacity to interact effectively with multinational forces, as well as with interagency, nongovernmental organizations (NGOs), and international organizations. The HQ is envisioned to consist of a multifunctional HQ nucleus, with embedded joint staff elements and linkages (full joint interoperability), plus a standard base of subordinate communications, sustainment, and battlefield surveillance commands. Battle Command is a core competency of all Future Force units, including organic capabilities for collaboration on the move, continuous assessment, and predictive analysis. Tactical-level HQ resource and execute combat operations; designate objectives; coordinate with multiservice, interagency, multinational and nongovernmental activities; and employ long range fires, aviation and sustainment; while enabling C4ISR and tactical direction to Units of Action/Brigades. The C4ISR Architecture includes networked communications, sensor, C2, and distributed information management (IM) and training. The communications architecture is a layered (terrestrial, near-terrestrial, airborne, space-borne) self-forming, self-healing, heterogeneous, mobile ad-hoc network. Joint and Coalition forces must have special purpose sensors capable of detecting and classifying full spectrum chemical, biological, radiological and nuclear (CBRN) threats. These CBRN sensors must be integrated to accept data from disparate sensors existing for specific purposes not related to CBRN (meteorological, fire control, and others) that, when combined with CBRN sensor data, produce a synergistic data improvement. Sensors provide persistent surveillance through a series of layers of individual Soldier systems, vehicle warning and defensive aids, organic unmanned aerial vehicles (UAVs), Unmanned Ground Sensors, and external sensors from the UE, Army, theater, national, and joint assets. The Future Force Operational HQ attains organic, higher-level Army, joint, and coalition effects to set conditions to enter battle on our terms, seize the initiative before contact, and employ our strengths against enemy weaknesses.

b. Narrative.

(1) Battle command, at all echelons within the Future Force, requires the following capabilities:

- Expanded span of control, enabled by a knowledge backbone.

- Improved horizontal integration of information, based upon multifunctional staff officers in non-traditional staff organizations.
- Highly distributed, mobile CPs that provide Battle Command 'on the move.'
- In-stride synchronization permitted by fully networked forces which can adjust rapidly to changing situations and synchronize efforts in-stride, during execution, with minimal intervention or direction.
- Higher levels of battlefield visualization, to anticipate how best to apply forces and means to shape the future battle, while continuing to provide the appropriate level of support to on-going operations.
- Balanced virtual and physical presence of the commander, by providing digital linkages to subordinate commands, for virtual forward presence of the commander, in cases when the commander must be at a CP.
- Airborne C2 provided from UE-level aviation.
- Integrated, full spectrum CBRN sensors coupled with Disparate Sensors to enhance threat awareness and C2 across the battlespace.
- Mature battlespace modeling and simulations including Transport and Dispersion (T&D) models that depict full spectrum CBRN contamination in near-realtime across the battlespace.
- Air and ground reconnaissance vehicles capable of detecting, classifying, and alerting affected Joint, Coalition, and civilian populace of full spectrum CBRN threats.
- Antennae for all systems that maximize communication and data transfer capability while minimizing signature and risk to Soldiers.

(2) Capabilities derived from the Battle Command Construct will enable Future Force leaders to:

- Know the natural environment (terrain and weather), and appreciate its tactical implications for tactical concealment, employment of weapons, mobility, and seeking positions of advantage.
- Know the threat, their capabilities, composition, and disposition; discern intent, movement, strength, and limitations.
- Know the civil environment (people and places) and appreciate its implications on tactical, operational, and strategic planning, coordination, and mission accomplishment.
- Know friendly forces' location and capabilities.
- Control and distribute fires (lethal and nonlethal). Know where to establish priorities in fire plans.
- Adapt to emerging situations more quickly than an adversary, and be able to adjust in real time to developing enemy actions, as opposed to merely fighting a plan.
- Direct effective maneuver, and fully integrate fires with maneuver.
- Rapidly resynchronize forces and functions to mitigate the potential loss of combat power.
- Know real-time sustainment posture and anticipate requirements.
- Use predictive planning and decision-making tools.

- Employ embedded training (ET).
- Decision Support Tools (DST) that support integrated operations despite full spectrum CBRN contamination threats and populate the COP with near-realtime CBRN hazards.
- Employ common threat assessment, Challenge Levels, and complimentary protection level terminology and standards across Joint and Coalition forces.
- Enable multiple users to access classified information to the level of their security clearance without compromising overall data and plans.
- Know the nature of the society and culture, and anticipate its behavior; mitigate resulting friction through prudent consideration of cultural factors.
- Know the impact of social and cultural dynamics of population groups on a regional basis including key ethnic, religious, tribal, economic, institutional and political attributes, processes and relationships.

(3) Army Future Force C2 capabilities must be developed in synchronization with, and subordination to, the emerging Joint Forces Command (JFCOM) Standing Joint Force Headquarters-Core Element (SJFHQ-CE) command and control initiative to ensure system interoperability and integration. Joint Task Force command and control requires capabilities for the preparation and training of commanders and staff personnel, to achieve and sustain readiness, permitting rapid deployment and employment of the JTF HQ. Capabilities must include the ability of Joint and Coalition organizations to access classified databases without overly restrictive or redundant classified files. This access must allow those without clearances to access unclassified data supporting classified data or actions at one source while those with clearances access the same source for classified information. Capabilities must permit the rapid incorporation of different groups into a coherent organization across echelon, function, and time. Automation processes are required that provide the foundation for timely decisions within a collaborative, networked environment, based on operational net assessment. Capabilities must permit the HQ to disperse and distribute elements geographically, and to exploit reach capabilities. Processes within the HQ must be designed and equipped to permit simultaneous, parallel processing across functional areas. Other capabilities required to synchronize with the SJFHQ-CE initiative are:

- Universal standing operating procedures to guide JTF staff processes.
- Organizational designs of joint and Army echelon battle staffs that facilitate simultaneous, vice sequential action, and permit rapid decision-making, planning, and effective C2 of current operations.
- A standard, deployable JTF C2 capability.
- Organic joint staff elements at the operational level, to enhance coordination and exploitation of joint capabilities, to support operations from operational to tactical level.

   c. Linkage to Army Universal Task List (AUTL): Army Tactical Task (ART) 7.0 (The Command and Control Battlefield Operating System); ART 7.1 (Establish Command Post Operations); ART 7.2 (Manage Tactical Information); ART 7.3 (Assess Tactical Situation and Operations); ART 7.4 (Plan Tactical Operations Using the Military Decisionmaking Process/Troop Leading Procedures); ART 7.4.6 (Provide Space Support).

d. Linkage to Universal Joint Task List (UJTL): Operational (OP) 5 (Provide Operational C2); Tactical (TA) 5 (Exercise C2).

4-4. FOC-01-02: Army Client to the Global Information Grid (GIG).

a. Capstone Capabilities. Establish the architecture for a single, integrated tactical network, with universal, worldwide accessibility to the GIG that links Soldiers, units, sensors, weapons, and systems with communications that are unconstrained by terrain. Such a system will provide C2 on the move, achieve information dominance (IS), facilitate the exchange of information between joint, allied, and coalition forces, and support the warfighter with integrated and reliable, real time access to the GIG, anywhere in the world.

b. Narrative. The Future Force will be integrated into the GIG by a highly mobile, self-organizing, self-healing, multilevel secure, resilient network that transports multiple forms of information among Future Force command echelons. It supports C2, situational awareness, sensor-to-shooter, and combat service support (CSS) applications. The network can rapidly deploy, to support a highly mobile force, and facilitates the conduct of en route mission planning and rehearsal. Access through global systems provides use of key INFOSYS to the warfighter, immediately upon arrival in theater. This network can operate in all potential environments, while maneuver platforms, and in some cases the supporting architecture itself, are on the move. It will be dynamically reconfigurable, allowing tailoring of networks for time-critical missions, specifically ensuring uninterrupted communications during decisive and long-range operations. Through the use of ET modules, the network will support individual and collective training, in any environment.

c. Linkage to AUTL: ART 7.1 (Establish Command Post Operations); ART 7.2 (Manage Tactical Information); ART 7.5 (Prepare for Tactical Operations); ART 7.6 (Execute Tactical Operations); ART 7.2.1.4 (Establish a Tactical Information Network and System); ART 7.2.5 (Disseminate Common Operational Picture and Execution Information to High, Lower, Adjacent, Supported, and Supporting Organizations).

d. Linkage to UJTL: Strategic Theater (ST) 5 (Provide Theater Strategic C2, Communications, and Computers (C4)); (OP) 5 (Provide Operational C2)

4-5. FOC-01-03: Network Operations.

a. Capstone Capabilities.

(1) Network operations consists of communications, and the means to effectively protect and manage the flow of information, through prevention, monitoring, detection and dynamic prioritization, allocation, and response. Network operations must integrate, direct, and prioritize the information flow between units, decision-makers, sensors and shooters. It allows seamless operations across, while integrating the full capability of, the GIG. Communications will consist of multiple tiers or layers, including terrestrial, airborne, and space. The Future Force C4ISR network must be interoperable. Network components in each layer are interconnected to form a

survivable, self-configuring, self-healing backbone. Layered redundancy also ensures there is no single point of failure. Reliance on multiple layers also reduces technological and programmatic risks incurred by over-dependence on communications assets in any single layer. These layers will be combined to operate as a single integrated network, fully integrated with the GIG. Future electronic systems must meet Electromagnetic Interference/Electromagnetic Compatibility requirements of MIL STD 464.

(2) Future Forces must be interoperable with joint forces, and systems consistent with the mission and responsibilities of each echelon. Any and all Future Force combat systems must be capable of supporting operations with Current and interim units, coalition forces, interagency, intergovernmental elements and partner nations. Future Force C4ISR network must comply with appropriate requirements in the following Capstone Requirements Documents (CRDs): Global Combat Support System, Global Air Traffic Management, Military Satellite Communications, Unified Cryptological System, Combat Identification, Global Information Grid (GIG), Hard and Deeply Buried Targets, Imagery and Geospatial, Theater Air Missile Defense (TAMD), and Distributed Common Ground Station. Future combat system critical information exchange requirements (IERs) and appropriate requirements defined in the CRDs primarily drive this requirement. Joint and Coalition partners must have common CBRN sensors, Doctrine, and Training to make CBRN defense fully interoperable.

(3) Network Operations must include Networked Fires. Networked fires are the triad of relevant sensors, effects capabilities, and battle command that enables dynamic application of lethal and nonlethal effects, to achieve the commander's tactical and operational objectives. Networked fires are a component of the battle command construct, and supporting communications architecture. See FOC-05-02: NLOS Lethality for a detailed discussion of Networked Fires.

(4) Future Forces must have a networked, integrated approach to air and missile defense (AMD) to enable all future combat platforms to receive early warning, and conduct self-defense counter-air engagements against low and slow moving portions of the rotary wing and UAV threat, and against rocket, artillery and mortar fires (RAM). Future Forces must have organic battle command capabilities necessary to provide third dimension situational awareness, situational understanding, and battle management, for both organic tactical and supporting operational AMD fires. The tactical Future Force must enable its commanders to effectively orchestrate integrated air and ground maneuver, fires, and air defenses in support of sustainment, shaping, and decisive operations, within their respective AOs.

(5) Future Force networks and INFOSYS must conform to the Joint Technical Architecture for Information Management, and emerging Army Knowledge Enterprise Architecture, leveraging Warfighter Information Network-Tactical (WIN-T) and Joint Tactical Radio System (JTRS) capabilities. Embedded training system must provide interfaces that allow interoperability with the current and interim synthetic training environment (e.g., Combined Arms Tactical Trainer; Joint Simulation System). The Future Force networks and information systems must provide fully integrated DSTs to Chemical and non-Chemical units that provide near-realtime full spectrum CBRN warnings to avoid CBRN hazards through movement around the hazards, or protect themselves by donning protective gear, closing vehicles, or sealing

protective shelters. By doing so, the Future Force will possess increased survivability and improved mission accomplishment probability.

(6) Future Force systems must comply with the IER format and development guidance contained within CJCS Instruction 6212.01B. Future Force systems must be reasonably hardened (Threshold)/fully hardened (Objective) against the effects of electromagnetic pulse (EMP). Systems must be fully hardened IAW existing Joint Chief of Staff guidance, published Military Standards, and Executive Order 13231, 16 Oct 01, Critical Infrastructure Protection in the Information Age. Any hardware fielded as a result of this requirement must not produce unacceptable electromagnetic emissions that interfere with, or degrade, the performance of existing platform/dismounted Soldier instrumentation, weapons, sensors, or communications subsystems.

(7) Battle Command Systems must process, send, receive, display, and store information classified up to SECRET. Overall, the system must comply with INFOSEC requirements of Army Regulation (AR) 380-19. The system hardware must include the provision of TEMPEST safeguards, applicable to appropriate elements of Future Force combat systems. Many systems will exchange both classified and unclassified information among all echelons, horizontally and vertically operating in the AO. Mechanisms are needed to protect data confidentiality from both internal and external sources. Future Force units must possess embedded capability to encrypt/decrypt, or encode/decode, with existing COMSEC equipment, using National Security Agency-approved techniques. Information safeguards will be a paramount concern for the Future Force network. Specific techniques must be used in order to protect the network from compromise, or intentional corruption by enemy Information Warfare attacks, to prevent the loss of information/data.

(8) Battle Command systems must be capable of collaborative planning, information sharing and full interoperability with joint, interagency, coalition and partner nations in both the unclassified and classified realm**.**

b. Narrative.

(1) Future Forces will rely on a knowledge-based C4ISR network, vertically and horizontally integrated from strategic to tactical levels. Future Forces must be interoperable with joint forces, and systems consistent with the mission and responsibilities of each echelon. Future Forces must be capable of supporting operations with Current and interim units, coalition forces, and interagency partners, partner nations, and NGOs/IOs**.** Drawing information, updated in near real time, from a wide variety of automated and manual sources, this knowledge backbone will be focused on improving and accelerating the decision-action cycle. Sources include Soldier reports, remotely deployed sensors, on-board sensors, UAVs and UGVs, traditional and new ISR means, space platforms, and an assortment of correlated databases, both DoD and civilian-based. The network will sharply enhance the lethality, survivability, agility, and versatility of the force, enabling more effective and timely application of the elements of combat power. Improved organic and joint sensor-shooter linkages, rationalized through sensor fusion, and self-synchronization communications networks, will reduce latency, and expand the means and rapidity within which targets can be engaged. Communications networks will have extended

range, non-line of sight (NLOS), redundant capabilities to assure connectivity of strategic, operational, and tactical echelons—to the lowest tactical echelons, regardless of terrain conditions. Communications networks must provide seamless, full spectrum CBRN threat awareness to include standardized terminology and threat levels across Joint and Coalition force networks. Communications networks must have continuous connectivity, through multiple pathways, to provide unity of effort, and extend the commander's reach. Future Forces will routinely exploit the overhead constellation of military and civilian space platforms for intelligence, focused surveillance, area reconnaissance, weather, long-haul communications, early warning, positioning, timing, navigation, missile defense, and access to the GIG. Space support will extend to the tactical level, and prove particularly indispensable in immature theaters where existing communications infrastructure may be insufficient, or unreliable. Airborne communications relays will assure NLOS connectivity. Network operations provide the exchange of information over the Army Client Architecture, executed successfully in support of warfighter and functional area applications. Network operations integrate the regulating functions of IA, network management, and information dissemination management to accomplish this task. The network management function monitors and controls the collection of assets that transport, store, process, and provides the human-system interface to information sources. The function monitors network performance and automatically adjusts, or reconfigures, to meet the demands of user systems. Information dissemination management is the set of information awareness, access, delivery and support services, that provide the capability for information producers and users to locate, retrieve, and send/receive information across the Tactical-Global Network, by the most efficient and effective means, consistent with the commander's policy.

(2) At the National, combatant command (COCOM), and major command levels, there must be a system to connect military planners and decision makers to civilian organizations such as the Health and Human Services, World Health Organization, hospitals, and retail sales sources. This connectivity can link seemingly trivial indicators (rash of respiratory cases, ballooning over the shelf medication sales, industrial chemical ailments, etc) that may indicate a weapons of mass effect (WME) attack masked by cyclic, seasonal illnesses (flu or allergy seasons, holiday travel crowds). This connectivity also provides planners with critical information about on-going threats to the civil component (environmental/natural), and subsequently Army forces, to facilitate force protection measures and additional planning for stability operations simultaneous to combat operations.

c. Linkage to AUTL: ART 7.1 (Establish Command Post Operations); ART 7.2 (Manage Tactical Information); ART 7.5 (Prepare for Tactical Operations).

d. Linkage to UJTL: ST 5 (Provide Theater Strategic Command and Control, Communications, and Computers (C4)); OP 5 (Provide Operational Command and Control (C2)); TA 5 (Exercise Command and Control).

4-6. FOC-01-04: Decision and Planning Support.

a. Capstone Capabilities.

(1) Future Force commanders require capabilities to enable more rapid decision-action cycles, with much less effort required to understand what is happening. Tools and techniques must provide an automated, running estimate of the situation; an abbreviated, continuous planning cycle incorporating predictive analysis; ability to receive mission updates and conduct planning and rehearsal while en-route; and the rapid generation and dissemination of mission orders. Commanders practice a continuous, focused intelligence preparation of the battlefield (IPB) and estimate process. The result is increased freedom of action that is preserved longer, and a greater ability to cause the enemy to see and understand last, or wrongly.

(2) More effective IM, accompanied by automated, near-simultaneous updates in current information, will enable battle command. It will also provide commanders and battle staffs with automated cognitive decision aids and real-time distributed, multiechelon collaborative planning support tools, including urban-specific decision aids and planning tools, to achieve knowledge-based course(s) of action development, wargaming, and decision support. Systems must be mobile, fully interoperable in the joint, multinational, interagency operational environment, and tied into the protected, network-centric, assured communications architecture to include reach-back. Tools that enable UE, and UE reach-back for information and intelligence, also enable 'report-back' of planning, analytical, and targeting information, to supporting HQ and centers external to the JOA, located in adjacent theaters, ISBs, or home station. Reach-back connectivity will permit exploitation of virtual staffs, planning, analytical, and information sources located outside the immediate area of operations (AO).

(3) Future Force commanders need the planning support tools and decision aides to analyze and determine alternative courses of action in pre- and post-conflict environments due to potential impact of regional elements to include power relationships at all levels, societal dynamics, infrastructure, a region's cultural and religious values and customs, economics, languages, and various means to influence the inter-relationships and dynamics

(4) Future Force commanders require computer-based, three-dimensional mission planning and area mapping tools. These tools will assist the Force with en route mission planning, building area databases during the intelligence collection process, and improved situational awareness.

(5) Future Force commanders require a red teaming capability that can independently and continuously challenge concepts, plans, operations, and capabilities in the context of the operational environment and from our partners' and adversaries' perspectives.

(6) Future Force commanders need the ability to quickly develop an automated force package and associated time-phased force and deployment data (TPFDD) for deliberate planning, crises action planning, campaign planning, and execution that provides a TPFDD and plan analysis capability that has the following additional attributes:

- A flexible, rapid, and accurate TPFDD of modular capabilities for easy force flow reconfiguration.
- Facilitate multiple service planners to simultaneously build respective component forces.

- Ability to change COAs and quickly re-analyze force flows in a seamless fashion.

- Integrate ability to incrementally move forces through the increased use of a Request for Forces and Deployment Order.

(7) Future Force commanders need an enabled battle command and planning capability that enables joint forces en route on any strategic lift platform to: receive updates on the developing situation in the JOA; interoperate with organic battle command systems; maintain a common operating picture with forces already in theater; and abbreviate reception, staging on-ward movement and integration (RSOI) and the time required for arriving forces to plug into in-theater C4ISR structures. Embedded packages will permit deploying forces to build situational understanding while en route and refine plans for immediate operations upon arrival. This approach will further accelerate parallel force flow, sharply enhance strategic and operational agility, help deceive the enemy, and reduce his ability to deny access.

(8) Future Force commanders must have increased full spectrum CBRN hazard and survivability tools. The Future Force must be able to plan for, execute, and modify movement plans caused by CBRN or WME attack. The Future Force experiences its greatest threat from improvised explosive devices (IEDs). The Future Force must be able to differentiate between IEDs filled with just explosives or explosives with CBRN materials.

(9) The Future Force commander (whether in movement or at an installation) must have a DST that enables rapid assessments of numbers and locations for chemical, biological, radiological and nuclear (CBRN) sensors (based on location variables such as topography, climate, prevailing winds, likely threat locations, etc) to protect Joint and Coalition assets and personnel.

(10) Provide processes, decision aids and analysis tools to assist in installation planning for effective and efficient operational support at national, regional and installation levels. (See FOC 08-04 – Installations as Flagships)

(11) Provide to medical staffs a DST and training suite that diagnoses a CBRN contaminated patient and then recommends an appropriate handling, medical plan, and reporting regimen.

b. **Narrative.**

(1) Decision and planning support capabilities assist the commander and battle staff in mission planning, preparation, and execution across the full spectrum of operations. The BCS must be capable of receiving multiple forms of information updates en route (aboard aircraft), and share the information between aircraft. Decision-making must take advantage of information available, on seamless information networks, to plan and rehearse operations. Embedded training, simulation tools, and three-dimensional battlespace visualization must be incorporated into decision support software. Decision aids should focus the commander and staff on critical information requirements, and allow collection of relevant information and intelligence to support COA development, and wargaming. Systems support must consider the basic command, control, communications and computers (C4) principles of interoperable,

flexible, responsive, mobile, disciplined, survivable, and sustainable. Information display must consider man-machine interface with the goal of reducing cognitive workload for the viewer. Additionally, this capability must automate and streamline the decision process and assist decision makers in synchronizing IO capabilities across the full spectrum of operations.

(2) Capabilities for routine planning and integration of joint and coalition support for fires/effects from air and naval platforms, targeting capabilities, and reinforcing information operations (IO) permit the seamless combination of mutually supportive dominant precision maneuver and precision engagement.

(3) Red teaming is a command function that is focused on improving decision making at all levels. It is based on the premise that competitive advantage occurs as a result of many factors—operational experience, intuition, reasoning, analytical skills, intelligence and access to relevant subject matter expertise. Red teaming is a structured and iterative process executed by trained, educated, and practiced team members who have real time access to subject matter expertise through a network connected reach back capability. Effective red teams will ensure the commander and staff routinely consider the 2nd and 3rd order effects of military operations. Red team efforts will optimize intelligence and operations planning efforts, with virtually every action being red teamed as an integral part of the planning and decision making process. To be effective, red teaming must be conducted in an environment that understands and values its role in battle command.

(4) Gaps between early entry, and follow-on forces must be closed and become seamless to avoid an extended defensive posture or potentially dangerous operational pauses. In accordance with the principles of effects-based planning, force flow must also be based on an end-to-end analysis of the joint campaign plan, beginning with the desired end-state and extending backward in time to the joint deployment plan. Information superiority and situational understanding enable the joint force commander to apply rapidly building combat power on the right tasks, and at the right time and place in execution of the joint campaign plan. Thus, effective strategic response for the joint force is a combination of strategic speed and power, based on superior knowledge and joint interdependence.

(5) A Joint, web-based, collaborative tool is required to assist the warfighting Combatant Commanders and their service components in their day-to-day operations and for use during crisis action, deliberate planning, and execution. This tool must allow for collaborative planning and information sharing between joint, interagency, multinational, coalition/partner nations, and other partners (i.e. NGOs/IOs) to facilitate enhanced situational awareness amongst specific communities of interest. The tool will provide the front end of the current deployment planning process and allow rapid re-sequencing of the priority of transportation flow for a true dynamic TPFDD in accordance with the capacity of the Defense Transportation System (DTS). Maneuver support and Sustainment force requirements must be generated automatically using service rules with minimal planner involvement using warfighter decisions for operating forces. When sustainment is computed, requirements are linked to using units. This capability will enable the Combatant Commanders and their service components to identify to U.S. Transportation Command (USTRANSCOM) their lift requirements and their unit sourcing

requirements to Force Providers. Force closure data (dates, modes, originations, destinations, modes, source, etc.) required by USTRANSCOM will be determined by the tool.

(6) Due to the size of Chemical units in relation to the Joint force structure, it is probable that an installation or unit CBRN officer and/or noncommissioned officer will not be trained and experienced Chemical Soldiers. With a CBRN sensor planning tool that assesses full spectrum threats in relation to varying, worldwide situations, even a semi-skilled staff section can use the sensor DST to establish the best mix and placement of CBRN and/or disparate sensors.

(7) The role of installations has changed significantly. No longer merely training, testing and deployment platforms and support for the well-being of Soldiers and their families, installations now provide continuous support from the foxhole to home station throughout deployment. Forces are sustained through reach operations reducing the in-theater footprint as well as providing unprecedented battle command and situational awareness at home station.

(7) In order to better prepare medical staffs, they need a training and DST suite to prepare them for CBRN/WME attacks.

c. Linkage to AUTL: ART 1.1.1 (Perform Intelligence Preparation of the Battlefield); ART 1.4.1 (Provide Intelligence Support to Targeting); ART 4.3.1 (Select Aerial Platforms to Engage/Destroy); ART 5.3.2.1.4 (Report NBC Hazards Throughout the Area of Operations); ART 7.1 (Establish Command Post Operations); ART 7.2 (Manage Tactical Information); ART 7.3 (Assess Tactical Situation and Operations); ART 7.4 (Plan Tactical Operations Using the Military Decision making Process/Troop Leading Procedures); ART 7.4.1 (Conduct the Military Decision making Process); ART 7.5 (Prepare for Tactical Operations).

d. Linkage to UJTL: ST 5.3.1.1 (Develop Theater Courses of Action and Prepare Staff Estimates); ST 5.3.1.2 (Analyze and Compare Theater Courses of Action); ST 5.3.1.4 (Conduct Mission Analysis and Prepare Mission Statement); OP 5.3 (Prepare Plans and Orders); TA 5 (Exercise Command and Control).

4-7. FOC-01-05: **Information Operations.**

a. Capstone Capabilities.

(1) Information dominance is a core competency of the Future Force that provides comprehensive situational understanding (SU), and generates a strategic-to-tactical infosphere. Information operations provides the Future Force with the capability to degrade, delay, deceive, disrupt, destroy, exploit, and/or deny an adversary's and other's information and INFOSYS; while protecting friendly information and INFOSYS. This enables the force to shape other's perceptions, reduce the effectiveness of an adversary's combat capability, reduce the ability of others to influence the success of military operations, and protect friendly and supporting C4ISR and IO systems, and the information that they provide. Information operations include the integration of a deception plan into operational orders, and the execution of the deception plan by techniques such as demonstrations, displays, feints, and ruses, along with the development and

use of decoys across the visual and electromagnetic spectrum, to generate false perceptions by the enemy commander. Information operations, when integrated and synchronized with IM and ISR, supports the Future Force achieving IS. Information dominance enables effective friendly decisions, based on accurate and timely information, while causing the adversary to make ineffective decisions, based on incomplete, untimely, and/or incorrect information. Information dominance enables the implementation of information as one of the five elements of combat power. It enables the commander to achieve freedom of maneuver and action in the battlespace, at the critical time and place of the commander's choosing, and/or shape the perceptions of the target audience(s), to cause them to act according to commander's intent. Information operations requires capabilities for blinding the enemy, through use of obscurants, jamming, signature reduction, deception, decoys, and pattern avoidance techniques, permitting the Future Force to see and understand first.

(2) The Future Force's ability to positively influence and shape the opinions, attitudes, and behaviors of select populations is critical to tactical, operational, and strategic success. The Future Force should have the capability to assess foreign target audience's vulnerability to U.S. influence, U.S. national policy objectives and public diplomacy initiatives, as well as developing psychological operations (PSYOP) plans, programs and products, disseminating PSYOP products, and integrating and synchronizing diplomatic, military and informational activities in peacetime and combat operations. The force must be capable of contributing to U.S. Governmental information campaigns designed to promote U.S. interests and support U.S. policy initiatives worldwide.

b. Narrative.

(1) Information dominance enables an information advantage that renders combat power more effective. Information dominance in the Future Force will be achieved by the synchronization of IO, IM, and ISR, using high performance technology, people, and organizations to shape operations. Information operations are conducted to impact the perceptions and decisions of adversary and other influential leaders; impact the C4ISR and IO capabilities of adversaries, and other military and nonmilitary organizations, which can negatively impact our operations; and protect friendly C4ISR, to include information itself.

(2) Information operations capabilities and related activities are used to achieve offensive and defensive IO objectives. Offensive objectives include affecting adversary leader perceptions and decisions; attacking enemy information, IO, decision-making, and communication processes; and impacting nonaligned and/or potential adversary leaders to support our operations, or stay neutral. Defensive objectives include protecting our C4ISR capabilities, focusing on C2 nodes, computer networks, and other means, including Soldiers, who collect information about the adversary and others in the battlespace. Additionally, defensive objectives include countering or blinding adversary and others C4ISR capabilities. These objectives may also focus on protection of information, especially essential elements of friendly information.

(3) Information operations elements include synchronized CNA/computer network defense (CND), PSYOP, military deception, electronic warfare (EW), special information operations (SIO), physical destruction, operational security, counterpropaganda, counter-deception, physical

security of C2, IA, counterintelligence, and related activities, such as civil affairs (CA) and public affairs (PA). Using CNA, PSYOP, military deception, EW, SIO, physical destruction, and other capabilities, IO can be used offensively to influence ideas, perceptions, beliefs, decisions, behavior and communication of information of enemy. Using IA, CND, PSYOP, military deception, counter-deception, EW, and other capabilities, IO can be used to defend decision making processes, by neutralizing adversary perception management and intelligence collection efforts, and attacks on our INFOSYS. Using CA, PA, PSYOP, and reconstruction/ relief activities, IO can be used proactively to persuade, shape and inspire regional populations to accept, assist and promote our intent and activities, particularly in pre- and post-conflict environments.

(4) Soon, IT-based tools will increase U.S. Army commanders' IO capabilities and combat power. Examples of such tools include the Internet, global broadcast television, network attack techniques (corruption of data or denial of service), electro-optic, electromagnetic, high power radio frequency, audio, and seismic weapons; special purpose/multi-spectral obscurants, advanced INFOSYS and network security, and 'intelligent agents.'

(5) Space control plays an important role in the preparations for decisive tactical combat. The elements of space control capabilities are surveillance, negation, protection, and prevention. Space control negation methods are further categorized as denial, disruption, deception, degradation, and destruction. The Future Force will employ far more sophisticated space control capabilities to negate adversary benefit from valuable space-derived and space-reliant information. Through electronics, kinetic or directed energy (DE) means, and other capabilities under development, the adversary's military decision process will be degraded.

   c. Linkage to AUTL: ART 1.4.2 (Provide Intelligence Support to IO).

   d. Linkage to UJTL: OP 5.6 (Coordinate Operational IO); TA 5.6 (Employ Tactical Information Operations).

4-8. Information Protection. While information protection is critical and inherent to Battle Command, it is discussed in detail in Protection, under FOC-07-03: Protect Information.

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Section II – Battlespace Awareness

> The Battlespace Awareness (BA) Functional Concept focuses on the ability of joint force commanders and all force elements to understand the environment in which they operate and the adversaries they face. In the future, efforts to create superior battlespace awareness will involve a constellation of highly responsive sensors providing persistent coverage of adversary targets. A producer interactive network, continuously synchronized with operations, will enable users to subscribe to both real-time and archived fused data.
>
> The capabilities needed to enable effective Battlespace Awareness fall into the following areas:
> - The ability to Command and Control Battlespace Awareness Assets.
> - The ability to Observe and Collect Information Worldwide.
> - Analysis of Intelligence Information.
> - The ability to Model, Simulate and Forecast.
> - The ability to Manage Knowledge.
> - Fusion.

4-9. Joint/Army Concept Linkage.

a. The BA Joint Functional Concept addresses the ways and means whereby the Joint Force Commander plans operations and exercises command and control. BA is "the result of the processing and presentation of information comprehending the operational environment – the status and dispositions of Friendly, Adversary, and non-aligned actors; and the impacts of physical, cultural, social, political, and economic factors on military operations."

b. Battlespace Awareness is an overarching, unifying concept mechanism to orchestrate and synchronize ISR operations across echelons, services, agencies and coalition partners, by enhancing collaboration, adding new capabilities, and, in some cases, performing existing functions more efficiently and effectively.

c. Battlespace Awareness provides commanders and force elements with the ability to make better decisions faster by enabling a more thorough understanding of the physical, socio-cultural, political and economic environment in which they operate, relevant friendly force data, the adversaries they face and non-aligned actors that could aid in or detract from friendly force battlespace success. BA intends to bring to bear a constellation of highly responsive sensors (e.g., unattended, human, intrusive and remote) providing persistent, redundant and tailored coverage of the battlespace.

d. BA represents harnessing the power of the networked force and ensuring that commanders at all levels have the information they need to make decision inside the adversary's decision cycle and within the construct of the socio-cultural in which they are deployed.

4-10. Desired Battlespace Awareness Capabilities.

a. The BA Functional Concept focuses on the ability of joint force commanders and all force elements to understand the environment in which they operate and the adversaries they face. In the future, efforts to create superior battlespace awareness will involve a constellation of highly responsive sensors providing persistent coverage of adversary targets and non-combatants in the operational area. A producer interactive network, continuously synchronized with operations, will enable users to subscribe to both real-time and archived fused data. Advanced fusion and assessment capabilities will help provide friendly forces with an understanding of the adversary's capabilities and the battlespace environment (terrain, weather and civil component effects), enabling commanders to make operational decisions more efficiently by providing actual and predictive cognizance. Additionally, socio-cultural indicators, direct and indirect, of regional population dynamics will provide sentence important dimensions to our understanding of the operational battlespace.

b. There are five components required to create operational battlespace awareness capabilities. These are outlined in the joint concept as follows:

- C2 of BA Assets.
- Observe and Collect Information Worldwide.
- Analysis of Intelligence Information.
- Model, Simulate and Forecast.
- Manage Knowledge.

While discussed separately in this section, the Battlespace Awareness capabilities are an integral part of Battle Command. The linkages can be seen in the discussion of FOC-01-01: C2.

c. Fusion is the critical technology that underpins these components and in many circles has become synonymous with BA functions. Fusion, by definition, is a series of processes to transform observable data into more detailed and refined information, knowledge, and understanding.

4-11. FOC-02-01: Command and Control (C2) of Battlespace Awareness Assets.

a. **Capstone Capabilities.** Capstone capabilities for C2 of BA assets include:

- ISR Synchronization and Display Tools.
- Asset control and optimization tools .
- Priority Intelligence Requirements (PIR) development, refinement, dissemination and integration.
- Planning and assessment tools.
- Distributed collaboration of Manned/Unmanned Platforms.

b. **Narrative.** C2 of BA assets is the ability to exercise appropriate, effective, and agile C2 of BA assets. The commander must be able to exercise C2 of BA assets worldwide under a range

of conditions. The C2 structure must be modular and tailorable in order to fit with a variety of organizations across the range of military operations. Examples include the capability to synchronize ISR with operations, task and dynamically re-task assets, monitor/track assets and their activities, and plan and assess BA operations.

c. Linkage to AUTL: ART 1.0 (The Intelligence Battlefield Operating System); ART 1.1 (Support to Situational Understanding); ART 1.3.2 (Perform ISR Integration); ART 1.3.3 (Conduct Tactical Reconnaissance); ART 1.3.4 (Conduct Surveillance); ART 1.4.1 (Provide Intelligence Support to Targeting) ART 7.0 (The Command and Control Battlefield Operating System).

d. Linkage to UJTL: ST 2 (Conduct Theater Strategic Intelligence, Surveillance, and Reconnaissance); OP 2 (Provide Operational Intelligence, Surveillance, and Reconnaissance); TA 2 (Develop Intelligence).

4-12. FOC-02-02: Observe and Collect Information Worldwide.

a. Capstone Capabilities. Capstone capabilities for observing and collecting information worldwide include:

- Find, fix, track, target, and assess (engagements) IEDs, weapons, munitions, and full spectrum CBNRE/WME.
- Detect, image, and characterize activity within urban structures.
- Detect, identify, and track with precision friendly and enemy forces, neutrals, and other groups in close proximity at stand-off distances including individual leadership figures and high value targets, in a complex and chaotic urban environment.
- Detect, image, and characterize activity in sub-surface locations.
- Find, fix, classify, and track friendly, enemy, and neutral fixed and moving equipment and people.
- Display and record in the common operational picture (COP) the successive positions of a moving contact.
- Observe, collect and characterize socio-cultural and institutional data and indicators including religious, ethnic, political, economic, and physical (infrastructure, natural resources) to predicatively assess the impact these spheres will/can have on planned or on-going military operations.
- All facilities, fixed and mobile (including those sub-surface and in urban areas)
- Independent events, of either human or natural source (riots, explosions, CBRN plumes, etc.).
- Organizations (IGOs, cells, conclaves, etc.).
- Assess and monitor the needs, perceptions, actions and reactions of indigenous population groups.

b. Narrative. Observe and Collect Information Worldwide is the ability to detect, identify, characterize, and track items, activities, conditions, and events worldwide of interest to commanders and decision-makers. This capability includes persistent observation,

reconnaissance, and information collection from both open and clandestine sources. The following contributing capabilities are critical for observation and collection: ready access by friendly forces, broad area surveillance, focus/stare on targets of interest, and measure and monitor environmental conditions.

   c. Linkage to AUTL: ART 1.0 (The Intelligence Battlefield Operating System); ART 1.1 (Support to Situational Understanding); ART 1.3.2 (Perform ISR Integration); ART 1.3.3 (Conduct Tactical Reconnaissance); ART 1.3.4 (Conduct Surveillance); ART 1.4.1 (Provide Intelligence Support to Targeting).

   d. Linkage to UJTL: ST 2 (Conduct Theater Strategic Intelligence, Surveillance, and Reconnaissance); OP 2 (Provide Operational Intelligence, Surveillance, and Reconnaissance); TA 2 (Develop Intelligence).

4-13. FOC-02-03: Analysis of Intelligence Information.

   a. Capstone Capabilities. Capstone capabilities needed for analysis of intelligence information include:

- Extraction and processing of battlefield entities from observations, to include:
  - o Automated/Aided object recognition from imagery (electro-optical (EO)/infrared (IR), synthetic aperture radar (SAR), multi-spectral/hyper-spectral (MS)/HS) and video sources.
  - o Tracking of ground objects from moving target indicator (MTI) Radar.
  - o Detection and geolocation of objects by acoustic, seismic, and magnetic sensors.
  - o Identification and geolocation of radio frequency (RF) emissions.
  - o Biometric measurements of individuals.
  - o Soldier/Observer field reporting.
  - o Free text processing of reports and of open-source media.
  - o Human speech translation and exploitation.
- Correlation of battlefield entities to remove duplications.
- Combining tracks of entities to provide enhanced coverage.
- Analyze relationships between entities, infer aggregated higher-echelon objects.
- Analyze activities by entities, aggregate into larger concepts of activity.
- Hypothesize and assess potential current courses of action, and future impacts to friendly operations.
- Provide analyst archiving, collaboration, mining, visualizing, and assessment tools.
- Integrate terrain, weather, and cultural/doctrinal factors into analysis.

- Develop decision making tools to identify socio-cultural issues and needs in order to predict the perceptions and actions and reactions of indigenous population groups in relation to on-going or planned military operations.
- Fusion of information routinely collected by both military and non-military organizations that routinely interface with the indigenous population.

b. Narrative. Analysis of Intelligence Information is the ability to use open and protected methods to discern patterns, opportunities, and vulnerabilities, and characterize information concerning an adversary in order to facilitate superior decision-making. This capability is a combination of both ability to conduct detailed, in-depth analysis of very specific phenomenology and the ability to fuse information from a wide variety of sources in order to create valuable insights and actionable, relevant information.

c. Linkage to AUTL: ART 1.0 (The Intelligence Battlefield Operating System); ART 1.1 (Support to Situational Understanding); ART 1.3.2 (Perform ISR Integration); ART 1.3.3 (Conduct Tactical Reconnaissance); ART 1.3.4 (Conduct Surveillance); ART 1.4.1 (Provide Intelligence Support to Targeting).

d. Linkage to UJTL: ST 2 (Conduct Theater Strategic Intelligence, Surveillance, and Reconnaissance); OP 2 (Provide Operational Intelligence, Surveillance, and Reconnaissance); TA 2 (Develop Intelligence).

4-14. FOC-02-04: Model, Simulate and Forecast

a. Capstone Capabilities. Capstone capabilities for Modeling, Simulation and Forecast include:

- 3D/Holographic visualization tools.
- Human Intelligence (HUMINT) and All Source collection models.
- Social/cultural models of communications and influence.
- Adversary courses of action models.
- Tech Collection models to predict/tailor future collection, based on environmental and sensor constraints and adversarial patterns of operations.
- Models to assess and prioritize reconstruction efforts in relation to the impact they will have on the adversary's decision cycle and indigenous population perceptions.

b. Narrative. Modeling, Simulation and Forecasting is the ability to utilize BA information to create an environment that allows for modeling, simulating, and forecasting in order to increase understanding, increase confidence, improve the planning (and execution) of courses of action, and decrease risk for commanders and analysts. Modeling, simulation, and forecasting activities range from accurate and timely weather predictions through support of operational rehearsals, training exercises, and military education. The following contributing capabilities are critical for modeling, simulation, and forecasting: auto-populate models and simulations; identify enemy courses of action; and integrate cultural, social and other non-military issues into predictive forecasts.

c. Linkage to AUTL: ART 1.0 (The Intelligence Battlefield Operating System); ART 1.1 (Support to Situational Understanding); ART 1.3.2 (Perform ISR Integration); ART 1.3.3 (Conduct Tactical Reconnaissance); ART 1.3.4 (Conduct Surveillance); ART 1.4.1 (Provide Intelligence Support to Targeting).

   d. Linkage to UJTL: ST 2 (Conduct Theater Strategic Intelligence, Surveillance, and Reconnaissance); OP 2 (Provide Operational Intelligence, Surveillance, and Reconnaissance); TA 2 (Develop Intelligence).

4-15. FOC-02-05: Manage Knowledge

   a. Capstone Capabilities. Managing Knowledge is the ability to store, retrieve, filter, fuse, and display information from a variety of sources in context in order to ensure that the right information reaches the right decision-maker in an actionable format in order to support superior decision-making. Capstone capabilities needed for managing knowledge include:

- Domain specific data representations – shareable across multiple domains.
- Multi-Level Security.
- Intuitive Man-Machine interfaces.
- Perform sensor signature management to include: visual, acoustic, seismic, infrared, magnetic, chemical, olfactory, and thermal.
- Perform management of biometrics data.
- ISR planning shared across JTF, UEy, UEx, and Brigade Combat Team (BCT).
- Provide rapidly updated three-dimensional mapping, imagery, or other products to operate in urban and sub-surface terrain.

   b. Narrative. Knowledge management includes horizontal and vertical integration of information from sensors, analytic centers, and decision-makers. The following contributing capabilities are critical for knowledge management:

- Smart pull/push information.
- Shared plan visibility.
- Maintaining an open archive.

Given that the nature of information is both synergistic and contextual, it is critical that analysts and agents be able to access past information to derive maximum benefit from the current findings. Effective knowledge management is critical to understanding the battlespace environment to enhance maneuver support. See FOC 06-06: Understand the Battlespace Environment for a detailed discussion of capabilities necessary to enable Maneuver Support.

   c. Linkage to AUTL: ART 1.0 (The Intelligence Battlefield Operating System); ART 1.1 (Support to Situational Understanding); ART 1.3.2 (Perform ISR Integration); ART 1.3.3 (Conduct Tactical Reconnaissance); ART 1.3.4 (Conduct Surveillance); ART 1.4.1 (Provide Intelligence Support to Targeting).

   d. Linkage to UJTL: ST 2 (Conduct Theater Strategic Intelligence, Surveillance, and Reconnaissance); OP 2 (Provide Operational Intelligence, Surveillance, and Reconnaissance); TA 2 (Develop Intelligence).

4-16. FOC-02-06: Fusion. Fusion is the critical technology that underpins these components and in many circles has become synonymous with BA functions. Fusion, by definition, is a

series of processes to transform observable data into more detailed and refined information, knowledge, and understanding. These processes, by their very nature, involve a mixture of automation and human cognition. All of the Capstone Capabilities required and outlined above have one or more aspects of fusion embedded within their constructs.

a. **Capstone Capabilities.**

(1) Just as the BA Functional Concept "begins and ends with the decision maker," so does the Army's development of battlespace awareness capabilities that provides actionable intelligence for commanders and decision-makers at all echelons. Actionable intelligence provides commanders and Soldiers a high level of situational awareness, delivered with the speed, accuracy and timeliness necessary to operate at their highest potential and to conduct successful operations. To achieve actionable intelligence, the future force must bring to bear a constellation of highly responsive sensors (e.g., unattended, human, intrusive and remote) providing persistent, redundant and tailored coverage of the battlespace.

(2) Sources of collected data will interact over a network to provide all force elements with the highest quality fused data. Within this "producer interactive network," force elements will subscribe to products or data (including archival data). Software agents will broker data and products, posting some unprocessed information. In this manner, all are provided access to common data, enabling Joint, Allied, and Coalition warfighters to construct tailor-able, relevant pictures.

(3) Commanders will maintain a deeper understanding of potential enemy courses of action by integrating archived and real time data to auto-populate models and simulations, and by leveraging these models and simulations in training and operations to perform rapid and continuous alternative forecasting. By providing simultaneous current and forecasted future depictions of intelligence resources, and insight into their potential responsiveness, the ISR Officer will be able to quickly re-task multiple sensors to react to emerging operational situations.

(4) Battlespace sensing (from manned aerial and ground platforms, unmanned aerial and ground vehicles or forces) will be incorporated into operations planning and execution. Environmental information (e.g., weather, terrain and civil component) will be augmented with information from battlespace sensors. All sources of information will be integrated into modeling and simulation to facilitate an understanding of the potential impacts of various courses of action.

b. **Narrative.**

(1) The commander establishes information requirements based on mission, enemy, terrain and weather, troops and support, time, and civil considerations (METT-TC). The fusion process, operating over integrated communications networks, includes accepting data from all ISR sources, organic and external. Sensors include combat platforms and Soldiers, organic manned and unmanned reconnaissance and surveillance platforms, and external constellations. Fusion ensures that a correlated, non-duplicative set of information is available across the force and

provides context to the information that has been acquired and enables situational understanding. This requires that data and information be converted as quickly as possible into actionable intelligence.

(2) There are six levels of fusion (0-5). However, it is levels 1 through 3 that add progressively greater meaning and involves more analysis. Level 4 is continuous and occurs at all levels of fusion. The fusion levels are:

- Level 0: Organize (extracts battlefield entities).
- Level 1: Correlate/Identify/Resolve (correlates battlefield entities).
- Level 2: Aggregates/Determines/Interprets/Determines/Hypothesizes/Resolves (associates and aggregates entities, determines activity and current courses of action).
- Level 3: Interprets/Determines/Predicts (assesses future red/blue courses of action).
- Level 4: Assesses/Reviews Performance (serves as feedback of Levels 1-3).
- Level 5: Visualize (provides user interface to collected and fused data).

c. Linkage to AUTL: ART 1.0 (The Intelligence Battlefield Operating System); ART 1.1 (Support to Situational Understanding); ART 1.3.2 (Perform ISR Integration); ART 1.3.3 (Conduct Tactical Reconnaissance); ART 1.3.4 (Conduct Surveillance); ART 1.4.1 (Provide Intelligence Support to Targeting).

d. Linkage to UJTL: ST 2 (Conduct Theater Strategic Intelligence, Surveillance, and Reconnaissance); OP 2 (Provide Operational Intelligence, Surveillance, and Reconnaissance); TA 2 (Develop Intelligence).

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Section III – Mounted/Dismounted Maneuver

The defining capability of the Future Force is strategic, operational, and tactical maneuver. Capabilities are required for precise, decisive maneuver, horizontal and vertical, day and night, in all terrain and weather conditions, synchronized with Army and joint fires, and RSTA. In future operations, decisive maneuver will be central to entering the fight on our terms, seizing and retaining the initiative, and finishing rapidly. Essential capabilities to enable mounted/dismounted maneuver are:

- Effective battle command.

- Unsurpassed battlespace awareness.

- Exceptional air-maneuver support.

- Dependable and accurate LOS/BLOS/NLOS lethality.

- Maneuver support.

- Enhanced protection capabilities to protect personnel, physical assets and information.

- Ability to deploy rapidly to be strategically responsive.

- Sustainment of the highest quality for our Soldiers and their equipment, with a minimal Soldier's load and the smallest logistics footprint possible.

- Quality, realistic, accessible training.

- Human engineering programs to improve Soldier-system interface.

- Enhanced Mobility and ability to shoot in multiple directions simultaneously.

- Operations in Urban and Complex Terrain.

4-17. Joint /Army Concept Linkage.

    a. The Force Application Joint Functional Concept describes capabilities and attributes necessary to successfully apply force in the future military environment as documented in the Joint Operations Concepts and this pamphlet. Attributes are a means to assess capabilities in areas essential to force application. The force application attributes are: lethal, non-lethal, discriminating effects, predictive planning, streamlined C2, networked forces, tailorable forces, strategic agility, tactical agility, synchronized operations, and tactical dominance. They build on the attributes stated in the Joint Operations Concept, but put a focus on desirable qualities to be pursued when considering force application improvements.

    b. Army Future Force tactical units operating as part of the joint team will be required to win on the offensive, initiate combat on their terms, gain and retain the initiative, build momentum quickly, and win decisively while simultaneously conducting stability operations to achieve long-lasting effects and facilitate transition. They must be masters of transition. Although necessarily optimized for offensive operations in major theater war, the Future Force must be equally effective at every point on the spectrum of operations, able to execute missions from offense, defense, to stability and support operations across the full spectrum of conflict. They

must be as comfortable and competent, in homeland security operations, as they are in combat operations overseas.

c. A major goal of the Future Force is to go well beyond the inherent strengths of current forces, recognizing that evolving technical and geostrategic conditions require dramatically new responses. We must retain strengths of quality leaders and Soldiers; reliable sustainment; heavy force speed, firepower, and combined arms capability and survivability; in combination with light/medium force versatility, deployability, and skill, in dismounted close combat—all within a single force design and common mobility regime.

4-18. Desired Mounted/Dismounted Maneuver Capabilities.

a. Similar to the operational-level concepts *Operational Maneuver* and *Tactical Maneuver*, this FOC area performs a function of integrating capabilities that enable maneuver. The capabilities needed to enable Mounted/Dismounted Maneuver are essentially covered in the other FOC areas but like subordinate concepts, are essential to enabling effective mounted and dismounted maneuver. These capabilities are essential regardless of the condition: day, night, open terrain, complex terrain, urban or desert environment.

(1) Battle Command. An efficient, networked, streamlined and dependable battle command construct is essential to controlling maneuver. Without it overall control and synchronization of effort is impossible. The capabilities necessary for effective battle command are discussed in Section I – Battle Command.

(2) BA. The BA is inextricably tied to battle command, and without it Mounted/Dismounted maneuver become virtually impossible. The capabilities for BA are discussed in Section II – Battlespace Awareness.

(3) Air Maneuver. The capabilities for Air Maneuver support and enable mounted/dismounted maneuver, both operationally and tactically. Capabilities for Air Maneuver are discussed in Section IV – Air Maneuver.

(4) Fires. Fires are critical for successful mounted/dismounted maneuver. Capabilities for fires are discussed in Section V – Line of Sight/Beyond Line of Sight/Non-Line of Sight (LOS/BLOS/NLOS) Lethality.

(5) Maneuver Support. Maneuver support is another key element necessary for mounted/dismounted maneuver. Maneuver support forces enable freedom of maneuver for mounted/dismounted forces, and deny freedom of maneuver for enemy forces. Specific capabilities for mounted/dismounted maneuver are discussed in Section VI – Maneuver Support.

(6) Protection. Personnel, physical asset and information protection is essential to preserve the force to be able to conduct maneuver. Improved means to detect IED must be a priority. Other specific capabilities are discussed in Section VII – Protection.

(7) Strategic Responsiveness and Deployability. Strategic responsiveness and deployability is essential for mounted/dismounted maneuver. The Future Force must, within a joint context, be capable of rapidly deploying worldwide and arrive ready to fight or conduct other full-spectrum operations immediately upon arrival. Capabilities for strategic responsiveness and deployability that enable mounted/dismounted maneuver are discussed in Section VIII – Strategic Responsiveness and Deployability.

(8) Maneuver Sustainment. Future Forces cannot conduct maneuver without having the right sustainment, at the right place, in the right quantities and at the right time. Specific capabilities for maneuver sustainment are discussed in Section IX – Maneuver Sustainment.

(9) Training. Quality, realistic training is essential to ensure Future Forces are adequately trained to conduct mounted/dismounted maneuver. Systems must have embedded training and mission rehearsal capabilities to enable Soldier training where facilities are lacking. Capabilities to enable quality training are discussed in Section X – Training.

(10) Human Engineering. Human engineering ensures the systems Future Force Soldiers employ enhance Soldier task performance rather than detract from it. Capabilities for human engineering are discussed in Section XI – Human Engineering.

(11) Stability.

b.   Additional capabilities envisioned to enable mounted/dismounted maneuver are identified in the following areas:

- Mobility.
- Operations in Urban and Complex Terrain.

4-19. FOC-03-01: Mobility.

a. **Capstone Capabilities.** Future Force units will possess superior tactical mobility. Platforms will negotiate the majority of surfaces—road, off-road, trails, CBRN contaminated terrain, water crossing, and narrow gaps. Units must possess superior capability to detect presence, identify disposition, and counter antitank and antipersonnel (AT/AP) mines, above and below surface, and booby traps, such as side-charge and remote detonated mines. Units must possess superior capability to detect and identify CBRN hazards. Mounted units require the ability to conduct route reconnaissance with forward looking and off-road sensors, to clear at greatly improved speeds (at least 50 kilometers per hour (kph)). Future Force vehicles must have improved ride quality, comfort and safety to reduce Soldier injury and ensure their fitness to fight upon arrival. Future Forces must have standoff means for detection and defeat of obstacles, the ability to mark or perform in-stride counters to neutralize mines at a distance, and the ability to detect and locate other man-made obstacles. Future Force operational architecture must enable real-time dissemination of reported obstacles throughout the force; provide capability, organic to tactical units, to breach disrupting and fixing obstacles in-stride, and to simultaneously engage enemy forces conducting over-watch of the obstacles. The Future Force must provide organic capabilities to cross narrow gaps, such as streams and irrigation ditches, without loss in

operational momentum, and enable dismounted assaults in urban terrain. Specific capabilities include:

- Multistory building entry through roofs and upper floor.

- Entry into, and through, subterranean complexes or collapsed structures.

- Wall breaching (50 inch x 70 inch holes, all types of construction).

- Enable protective countermobility and survivability position support available at transition to defensive operation.

- Incorporating full spectrum CBRN sensors, detectors, analyzers, and classification devices into ground and air vehicles.

- Provide near-real time CBRN agent detection capability.

- Enable large scale personal, equipment, and area CBRN agent decontamination with a low- to non-aqueous decontamination agent standard throughout Joint and Coalition forces.

- Provide a decontamination agent capable of decontaminating sensitive and electronic gear without destroying it.

- Provide remotely controlled ground vehicles capable of decontaminating equipment and vehicles without human presence despite encapsulating material (mud, ice, snow, et.) covering the CBRN agent.

   b. Linkage to AUTL: ART 2.2 (Conduct Tactical Maneuver); ART 2.3 (Conduct Tactical Troop Movements); ART 8.0 (Conduct Tactical Mission Tasks and Operations); ART 8.1 (Conduct Offensive Operations); ART 8.2.2 (Conduct a Mobile Defense); ART 8.5 (Conduct Tactical Mission Tasks).

   c. Linkage to UJTL: ST 1 (Deploy, Concentrate, and Maneuver Theater Forces); OP 1 (Conduct Operational Movement and Maneuver); TA 1 (Develop/Conduct Maneuver).

4-20. FOC-03-02: Operations in Urban and Complex Terrain.

   a. Capstone Capabilities.

   (1) The U.S. military structure, organization, doctrine, and technical capabilities are subjects of study by most nations of the world. These nations understand how our forces will fight, and what type of environments our forces are best suited. Using this knowledge, future opponents will seek to avoid operations in environments for which our forces are optimized. Thus, our adversaries will seek cover and concealment in complex terrain and urban environments, to offset standoff of U.S. Forces, and exploit the reduced inter-visibility ranges, to negate technological overmatch of standoff reconnaissance, surveillance and target acquisition (RSTA) and lethal effects.

(2) Today we can win in a complex terrain or urban fight, but with a high price, in terms of casualties and infrastructure damage. The Army does not currently dominate the complex terrain/urban battlespace. Our forces have limited ability to see into it, have limited ability to communicate and move within it, and because of the requirement to limit noncombatant casualties and physical damage, have limited means to shoot into it. The Future Force must be able to overcome these limitations, across the entire spectrum of operations, and dominate combat in urban and complex terrain, to the same degree present day U.S. Forces dominate the open maneuver battle. This includes operations from stability and support, to small-scale contingencies, and urban operations in a major combat operation (MCO). Future Forces must be capable of rapidly transitioning across the full spectrum of operations, and transitioning, without pause, between open and rolling to urban and complex terrain.

b. Narrative.

(1) There are several characteristics that define complex terrain and urban operations, and make them far different than operations on less restrictive terrain. These differences include short ranges of inter-visibility, presence of manmade structures, multidimensional battlespace, difficult target identification in limited engagement areas, restrictive maneuver space, toxic industrial material (TIM), and the presence of noncombatants. Additionally, some complex terrain is densely vegetated, providing numerous positions for enemy concealment. Urban operations are made even more difficult due to the restrictive rules of engagement (ROE). Urban battles of the future will continue to challenge the joint force commander and staff to avoid excessive collateral damage, and limit the number of noncombatant casualties. Future Force combat systems must provide the capability to support dismounted Soldiers to entering into, and moving through, subterranean complexes and collapsed structures to conduct squad and larger unit assault and clearing operations. Future Force weapons must be able to switch from lethal to nonlethal fires to minimize noncombatant casualties. Operations in urban and complex terrain require the Future Force to aggressively accomplish a multitude of complex warfighting tasks:

- The first, and quite possibly the most difficult, operational challenge for the Future Force will be the collection of intelligence and civil and cultural information. See Battlespace Awareness for collection capabilities required.

- The second operational challenge for the Future Force is the ability to move undetected to the AO. The assembling of a large force can send signals of possible invasion to an enemy (or their allies) that possesses advanced intelligence collection capability. Positioning is further complicated if the target areas (critical nodes and key terrain) are located deep within the city core. To enable the Future Force to conduct movement operations will require several enabling technologies and capabilities, which include:

  o The ability to interdict enemy intelligence collection capabilities. The Force must have the ability to move, without the threat of enemy long-range detection and interdiction. This capability must serve the Future Force from the point of departure, to within the objective area.

- o The ability to perform deception operations, requiring the use of unmanned systems (often equipped with acoustics), PSYOP, and the employment of Special Operations Forces (SOF).

- o Obscurant delivery systems that are capable of rapidly covering large areas, and maintaining effects for extended periods.

- o The ability of the Force to move under limited visibility conditions. This will require the development of advanced optical capabilities, which will allow Future Forces to move under all weather and light conditions, regardless of ambient lighting conditions. These systems must have the ability to adjust rapidly to changes in lighting conditions, negating 'white out' effects normally experienced during close quarter urban operations.

- o Systems must have the ability to move rapidly across open areas, and be highly maneuverable within the confines of the urban battlespace. Systems must have the ability to rapidly negotiate rubble, and reduce/negotiate obstacles, while on the move, and provide in-stride or rapid detection and protection against TIM in the battlespace.

- o Vertical takeoff and landing capability will be critical for the insertion and extraction of forces in the urban environment. Individual Soldiers will benefit from individual lift systems, which will allow them to rapidly ascend structures, overcome barriers, and bypass hazardous areas. While individual lift systems will never substitute for larger air delivery platforms, they will provide the Force (or a section of the Force) with a mobility advantage in the vertical plane during special missions, and under unique battlefield conditions, as required.

- The third operational challenge for the Future Force is the isolation of the urban objective(s). Isolation can involve an entire urban area, a specific point within the urban environment, or multiple points within the built-up area. Isolation requirements include both physical and information isolation. Once isolation is obtained, it remains a critical task throughout the conduct of the operation. Total isolation may diminish to entry/exit control, as the mission transitions from warfighting to peace operations. Actions during isolation operations will also serve to 'set conditions' for successful decisive operations. To enable the Force to conduct isolation operations, several enabling technologies and capabilities are essential. They include:

  - o Unmanned aerial, ground, and space platforms to assist with area isolation.

  - o A wide array of sensors to 'fill gaps' during large urban area operations.

  - o Large area nonlethal effects employed utilizing long-range precision fires and unmanned systems, to facilitate area denial, or to force the enemy into less restrictive engagement areas.

- o The ability to effect resource denial to enemy forces occupying the urban area, without completely destroying both the natural and built resource infrastructure.

- o The ability to perform surgical personnel and equipment engagements, counter-sniper operations, intelligence and civil and cultural information collection, target interdiction, and movement denial operations, both on the periphery, and within the urban core, make snipers a tremendous asset during full spectrum urban operations.

- o Snipers will significantly impact isolation operations during the urban fight as a whole. Snipers also have a significant psychological effect on enemy forces. Key capabilities required by snipers are:

  - ▪ State-of-the-art optical devices allowing operation in all light and weather conditions.

  - ▪ Optical systems utilized by 'Sniper Spotters' linked to a computer database, providing the sniper team with immediate notification, once priority targets have been selected.

  - ▪ A wide array of deployed sensors and unmanned systems to provide security for sniper teams.

  - ▪ 'Chameleon-like' camouflage equipment, lightweight, easily transportable, and deployable to allow the sniper to quickly adapt to any environment and remain undetected.

  - ▪ Weapons systems with low signature (acoustic and visual) systems that will provide all terrain/target/weather engagement capability.

  - ▪ A computerized database linked to weapons to allow a sniper to 'insert' his personal data into any sniper weapons system, and the system will automatically adjust (zero) to the individual. This allows the sniper to rapidly calibrate or recalibrate any system, at any time, on the battlefield.

  - ▪ Sensors within the weapons system to automatically adjust the point of aim based on distance, windage, target data, deflection, and other individual shooter input, allowing for rapid target engagement and transition.

- • The fourth operational challenge for the Future Force will be the conduct of decisive operations to destroy or remove enemy forces, secure the safety of U.S. citizens or interests, and enforce or maintain peace. Additionally, decisive operations may further deny the enemy resources and decisive terrain, deceive or divert the enemy, further develop intelligence, or simply fix the enemy in position. The end state for this phase of the operation is to set the conditions for successful offensive operations, and impose the will of the commander on the enemy. The Future Force will have the ability to enter the urban battlespace and conduct full spectrum operations; however, it must be capable of transitioning rapidly across this

spectrum, and operating at the various interim levels simultaneously. The Future Force must be capable of fighting in close quarters, as a member of a joint, multinational, combined arms team, during urban and complex terrain operations. To enable the Force to conduct decisive operations, the Future Force will require several enabling technologies and capabilities, which include:

o The ability to conduct decisive operations, under all weather and light conditions. All systems and capabilities within the Future Force must be capable of functioning at full potential, without degradation resulting from environmental effects.

o Superior C3 capabilities. Decisive operations require the ability to communicate effectively in real time, across the entire force, regardless of terrain, environmental conditions, organization, or operational distance.

o The option to employ precision lethal and nonlethal systems, while avoiding excessive collateral damage and negative effects on noncombatants. Precision-effects munitions must have the ability to penetrate deep within structures and subterranean battlespaces, to destroy or incapacitate enemy forces, without causing over-pressurization or other undesired effects to adjacent structures.

o Aerial launched and high-angle fires to engage targets, while overcoming the restrictive nature of the terrain. These systems will employ brilliant munitions to achieve precision effects.

o Dominant situational understanding in urban combat for the Future Force. See Battlespace Awareness for specific capabilities.

o Standoff breaching and obstacle reduction that will enable the Force to maintain operational momentum, and rapidly transition through the battlespace, with minimal exposure to enemy fires.

o A variety of robotic platforms, UAVs, and unmanned ground vehicles (UGVs), which will assist with clearing operations allow for greater Soldier standoff, provide early threat and hazard detection, conduct breaching operations, assist in reconnaissance, perform high-risk clearing operations and employ a wide variety of nonlethal effects.

o Unmanned systems, assisting Soldiers and other systems by carrying additional equipment and supplies that are mission essential but not immediately required, perform resupply operations during high-risk operational periods

o Weapons systems that have the ability to perform within the constraints of urban and complex terrain, without sacrificing their effectiveness on less restrictive terrain. Mounted weapons systems must have the ability to elevate sufficiently to engage enemy positions on upper-levels of structures, as well as at ground level. Some munitions utilized during urban operations will require adjustable settings, to compensate for limited ranges of engagement. Weapons systems will have significantly reduced over-pressurization effects

that will allow them to be fired from structures. Minimum safe distances will be significantly reduced, which allow for employment of effects within close proximity to dismounted forces.

(2) The Future Force will have the ability to physically mark TIM, CBRN contaminated, mined, cleared, and restricted (safe) areas. These standardized marking systems will be visible under all weather and lighting conditions. Forces will be capable of 'uploading' newly marked areas to the higher headquarters' database and 'downloading' the same. These capabilities will allow for improved battlefield situational understanding, and the avoidance of friendly force casualties.

(3) See Maneuver Support FOC-09-06, Global Casualty Care Management and Evacuation for Combat Lifesaver and casualty evacuation capabilities required.

(4) The transition from offensive (decisive) urban operations to defensive operations will be a significant challenge. Units will continue to conduct force protection (FP) activities; however, the shift from offensive actions to defense will most likely impact the ROE, placing even more restrictions upon the Force. Additionally, there may be an attempt by the noncombatant population to immediately return to their residences once hostilities have subsided. Noncombatants that were hiding during the hostilities will reemerge, adding confusion and congestion to the battlefield. Those enemy forces and sympathizers, that have yet to be identified, will certainly try to 'blend' into the civilian population.

(5) Successful transition from decisive operations to defensive operations will require the Future Force to:

- Employ a significant number of sensors and unmanned systems within the urban core, and on the periphery, to monitor noncombatant activities, and provide early warning against enemy activities. Unmanned systems and sensors, equipped with explosive and gunpowder detection capability, will assist in identifying enemy forces trying to 'blend' with the noncombatant population. Sensors that can monitor more than one dimension/media simultaneously will assist the commander in monitoring significantly more of the battlespace, while allowing the majority of the maneuver force to continue mission preparation, and other essential tasks.

- Communicate with, and control, the returning noncombatant population. Translation devices will allow the Force to effectively communicate with the populace. Unmanned systems can be deployed to meet returning noncombatants and guide them to 'control' areas, minimizing mass reentry chaos and confusion.

- Repair critical infrastructure to support the returning population. Limiting collateral damage during decisive operations will assist with this mission requirement. The identification of noncombatants, with the skills to assist with repairs, will expedite the rebuilding process; the ability to tap in to the urban database will assist with this identification process and the identification of infrastructure control grids.

    c. Linkage to AUTL: ART 2.2 (Conduct Tactical Maneuver); ART 2.3 (Conduct Tactical Troop Movements); ART 8.0 (Conduct Tactical Mission Tasks and Operations); ART 8.1 (Conduct Offensive Operations); ART 8.2.2 (Conduct a Mobile Defense); ART 8.5 (Conduct Tactical Mission Tasks).

    d. Linkage to UJTL: ST 1 (Deploy, Concentrate, and Maneuver Theater Forces); OP 1 (Conduct Operational Movement and Maneuver); TA 1 (Develop/Conduct Maneuver).

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Section IV – Air Maneuver

Army aviation and joint tactical air support must be closely integrated into ground maneuver operations. Aviation plays a major role in future force operations that use operational movement and maneuver, tactical maneuver/traditional forms of maneuver, vertical envelopment, mobile strike, and close combat. Traditional aviation missions of RSTA, attack and lift continue to be vital in the future force. Key missions envisioned for future force Air Maneuver are: Close Combat Attack, Mobile Strike, Reconnaissance, Vertical Maneuver/Envelopment, Security, Aerial Sustainment. Force operating capabilities envisioned to enable Future Force Air Maneuver concepts are:

- Responsive and Sustainable Aviation Support.
- Effective Aviation Operations in the Contemporary Operating Environment.
- RSTA and Attack Operations.
- Assured and Timely Connectivity with the Supported Force.
- Mounted Vertical Maneuver.

4-21. Joint/Army Concept Linkage. Army aviation plays a key role in supporting full-spectrum operations as envisioned in the Joint Operating Concepts (Homeland Security, Major Combat Operations, Stability Operations) and Joint Functional Concepts (Joint Command and Control, Battlespace Awareness, Force Application, Focused Logistics, Protection). Aviation, both manned and unmanned, is an integral member of the joint/combined arms team in that it conducts maneuver, maneuver support, and maneuver sustainment operations across the spectrum of conflict. Support of homeland security operations will likely involve significant Army aviation assets, particularly fixed wing aircraft. During deployment and early entry operations, Army aviation will perform vital reconnaissance and security operations, air movement of critical personnel and equipment throughout the area of operations, battle command, and crucial logistical support until ground lines of communication (LOCs) can be established. Through execution of its enduring core competencies, aviation is instrumental to the future force in simultaneous, distributed and continuous, combined arms air/ground operations, day and night, in open, close, and complex terrain throughout the battlespace. It is a major contributor in establishing land-force dominance, wresting the initiative from the enemy, forcing him onto the defensive, and defeating him in detail. Additionally, with dedicated aeromedical evacuation, combat casualties will be rapidly evacuated through the Combat Health Care System to definitive levels of medical care. Future force aviation units are designed to operate at a tempo that affords the enemy no rest or relief and no means of responding effectively. Aviation units develop situations while the ground force is out of contact, maneuver to positions of advantage, engage enemy forces beyond the range of their weapons, destroy them with precision fires, and provide close support to the tactical assault at the time and place of the Joint Force Commander's (JFC) choosing.

4-22. Desired Air Maneuver Capabilities. The required capabilities envisioned to fulfill the joint and Army concepts for Air Maneuver are:

- Improved operational availability/mission reliability/logistical support/reduction in parts obsolescence.

- Improved aircraft flight performance (range/lift/endurance).

- Improved aviation survivability against unpredictable and hard to detect threats.

- Improved ability to operate safely in obscured conditions and complex terrain.

- Ability to conduct effective aviation operations in high task-loaded environments (extended mission durations, NBC, UAVS control, etc.).

- Improved RSTA operations (target identification/near real-time reporting timelines).

- Perform mounted vertical maneuver with FCS vehicle-sized loads.

- Improved communications (extended distances, in presence of jamming countermeasures).

- Improved A2C2 and Air Traffic Services deployability, supportability, interoperability.

- Improved aviation weapon systems range, lethality, accuracy, flexibility.

4-23. FOC-04-01: Responsive and Sustainable Aviation Support

a. Capstone Capabilities.

- Maintain a 90 percent operational readiness rate with reduced O&S burden.
- Enable graceful function degradation to minimize mission aborts.
- Implement diagnostics/prognostics system to support an "on condition" based. maintenance system integrated into an automated paperless "just in time" logistics system.
- Reduce rearm/refuel times.
- Aircraft performance (range/lift/endurance/fuel efficiency) to execute missions in worldwide environments (high/hot/dusty/wet/etc) over extended battlespace distances.
- Deployable air and ship transportable aviation systems compatible with transport vehicles and timelines (self-deployable where applicable).

b. Narrative. Responsiveness is measured in terms of time, distance, and sustained momentum. It capitalizes on the positioning of forward-deployed forces and supplies as well as on strategic lift. It demands close, continuous coordination between Army component commanders and joint and interagency decision-making bodies to insert air and ground combat units into austere theaters through multiple unimproved entry points without relying on fixed ports and staging bases. Aviation operational availability, mission reliability, and logistics systems support responsiveness, mission effectiveness and affordability needs. Future operations emphasize maximum mission utilization of deployed systems and minimization of the logistics footprint. Army forces must be deployable and capable of quickly and rapidly concentrating

combat power in an operational area. The Army goal is to deploy a brigade combat team anywhere in the world within 96 hours after liftoff, a division within 120 hours, and five divisions within 30 days. This will require enhanced systems and capabilities. Systems must be transportable, logistics must be focused and flexible, and a culture must reside within the Army that accepts deployment readiness as a way of life. Army forces need support from the other services to achieve the required levels of deployability. Aircraft flight performance (range/lift/endurance) is not consistent with future force requirements. Fielded aircraft were not designed to operate over the expanded battlespace and lack the flight performance required to efficiently support worldwide operations. The Army's Airspace Management (Air Traffic Services) equipment is not well aligned with future force deployability, supportability, and interoperability requirements thereby risking safe operations, denying accurate air picture updates to the COP, and limiting the ability to conduct joint sustained and simultaneous operations. Army forces must be sustainable across the spectrum of conflict in a JIIM environment. Sustainability requirements reflect the continuous, uninterrupted provision of sustainment replenishment to Army forces.

c. **Linkage to AUTL:** ART 2.3 (Conduct Tactical Troop Movements); ART 6.1 (Provide Supplies); ART 6.2 (Provide Maintenance); ART 6.4.3 (Conduct Aerial Delivery Support); ART 6.5.2 (Provide Medical Evacuation); ART 8.3 (Conduct Stability Operations); ART 8.4 (Conduct Support Operations); ART 8.5.29 (Conduct Combat Search and Rescue).

d. **Linkage to UJTL:** OP 1.1 (Conduct Operational Movement); OP 1.6 (Conduct Patient Evacuation); OP 4.3 (Provide for Maintenance of Equipment in the JOA); OP 4.5.2 (Supply Operational Forces).

4-24. FOC-04-02: Effective Aviation Operations in the Contemporary Operating Environment.

a. **Capstone Capabilities**.

- Execute missions in world-wide environmental conditions (high/hot/dusty/etc.), and in complex/urban terrain. Conduct safe survivable operations in obscured conditions and avoid flight path and landing zone obstacles.
- Conduct survivable missions against threats that include unconventional hard to detect opponents using Cover, Concealment, Camouflage, Denial and Deception tactics to include operations in close proximity to non-combatants and civilian structures.
- Survivable aircraft that counter threat offensive systems, survive weapons lethal effects (to include chemical, biological, radiological and nuclear (CBRN)), and prevent/limit crew and passenger injuries, and system damage in crashes.
- Enhanced crew mission performance through management of cockpit workload to allow the crew to maintain better external situational awareness and understanding.

b. **Narrative.** Unlike previous operating environments, optimized for mass, momentum, and attrition warfare against a single well defined opponent, Army aviation must fight and win across

a wide range of conflict situations against various opponents with differing capabilities, from high to low ends of the operational spectrum, from MCO to Peacetime Military Engagement, and under a more expansive framework employing all elements of national power. Current aircraft systems do not enable safe operations across the range of expected mission conditions. Aviation must be able to operate worldwide in day/night and in reduced visibility conditions due to adverse weather and environmental obscurants (blowing dust, blowing snow, blowing debris). Effective aviation operations are also limited by high crew workload, ability to manage and control UAVs, conducting operations in NBC or other adverse environmental conditions, and extended duration missions. Workload intensive operations degrade crewmember, and operator ability to focus on the most mission-critical tasks and reduce safety. Anticipated mission complexity is driven by requirements to safely operate the aircraft, manage multiple inputs, control on-board and off-board sensors, communicate, manage, and control UAVs, and react to threat systems. This imposes high cognitive and physiological loads on crewmembers. Aviation survivability and reaction time are insufficient against unpredictable and hard to detect threats. Manned and unmanned aviation systems often operate against unpredictable threats and within the range of small arms fire, RPGs, MANPADs, anti-helicopter mines, and emplaced flight path obstacles. Ground and air platforms that employ the best combinations of low observability, ballistic protection, long-range acquisition and targeting, early attack, and high probability of first-round hit-and-kill technologies will be required to ensure the desired degrees of survivability.

   c. Linkage to AUTL: ART 1.3.3 (Conduct Tactical Reconnaissance); ART 2.2.10 (Navigate from One Point to Another); ART 3.1 (Decide Surface Targets to Attack); ART 3.2 (Detect and Locate Surface Targets); ART 3.3 (Employ Fires); ART 5.3 (Conduct Survivability Operations); ART 7.2 (Manage Tactical Information); ART 7.3 (Assess Tactical Situation and Operations); ART 7.5 (Prepare for Tactical Operations); ART 7.6 (Execute Tactical Operations); ART 8.0 (Conduct Tactical Mission Tasks and Operations).

   d. Linkage to UJTL: OP 2.2 (Collect and Share Operational Information); OP 2.3 (Process and Exploit Collected Operational Information); TA 6 (Protect the Force); TA 7.1 (Conduct Mission Operations in a CBRNE Environment).

4-25. FOC 04-03: RSTA and Attack Operations.

   a. Capstone Capabilities.

- Aviation systems that execute responsive focused RSTA missions in worldwide conditions, day or night, and in adverse weather to locate targets that may have low or indistinct signatures/emissions and that may use Cover, Concealment, Camouflage, Denial and Deception.
- Aviation capability to detect, identify, establish affiliation, and determine target location with sufficient accuracy for targeting, along with other pertinent battlefield information, and process/report the data through the network in a timely manner.
- Aviation attack assets that can rapidly and precisely destroy/neutralize threat ground, air, maritime or structural targets from a safe standoff distance in

day/night obscured and adverse weather conditions worldwide. Targets may be in high background clutter environments and may employ Cover, Concealment, Camouflage, Denial and Deception. Targets may be fixed or mobile with short exposure times and intermingled with non-combatant populations and urban infrastructure.

b. Narrative. Responsive, focused RSTA is required worldwide in day, night, adverse weather, and in the presence of Cover, Concealment, Camouflage, Denial and Deception usage. Targets may have low or indistinct signatures/emissions (small UAVs or UGVs, personnel, IEDs, mines, NBC agents, etc.). Aviation systems must be able to search AOs within times and at ranges consistent with survivable operations. Systems must allow detection, classification, recognition, identification, affiliation, and determine target location and precision needed for target acquisition and tracking. Systems must overcome enemy use of countermeasures. Data must be processed, confirmed, integrated into the COP compatible reports and disseminated in a time consistent with planning, engagement, and operational tempo (OPTEMPO) requirements. The effectiveness of aviation RSTA and attack operations is limited by our inability to detect and identify targets with low or indistinct signatures/emissions and by the excessive timelines to report information and acquire targets. Aviation weapon systems require sufficient range, lethality, accuracy, and/or flexibility to engage diverse target sets in the future operational environment at survivable ranges. Enhanced lethality will allow Army forces to destroy any opponent quickly with shattering effect. Lethal Army forces can combine the elements of combat power to provide overwhelming and decisive force at the right time, at the right place, and for the right purpose.

c. Linkage to AUTL: ART 1.3 (Conduct Intelligence, Surveillance, Reconnaissance (ISR)); ART 2.2 (Conduct Tactical Maneuver); ART 2.4 (Conduct Direct Fires); ART 3.1 (Decide Surface Targets to Attack); ART 3.2 (Detect and Locate Surface Targets); ART 3.3.1 (Conduct Lethal Fire Support); ART 5.3.5 (Conduct Security Operations); ART 7.2 (Manage Tactical Information); ART 7.3 (Assess Tactical Situation and Operations); ART 7.5 (Prepare for Tactical Operations); ART 7.6 (Execute Tactical Operations); ART 8.0 (Conduct Tactical Mission Tasks and Operations).

d. Linkage to UJTL: OP 1 (Conduct Operational Movement and Maneuver); OP 2 (Provide Operational ISR); OP 3 (Employ Operational Firepower); TA 2.4 (Disseminate Tactical Warning Information and Attack Assessment); TA 3 (Employ Firepower); TA 6 (Protect the Force).

4-26. FOC 04-04: Assured and Timely Connectivity with the Supported Force.

a. Capstone Capabilities.

- Aviation systems connectivity to future force elements compatible with Battle Command Construct requirements.
- Communication system will have assured real-time connectivity at extended ranges and NLOS conditions common to aviation missions.
- Communication system will have sufficient bandwidth to handle analog and digital voice and data message traffic.

- Communication system will not be susceptible to jamming and adverse
  environmental interference.
- Air Traffic Services will provide real-time airspace deconfliction to ensure
  safe and efficient mission execution along with threat warning.

b. Narrative. Communications are required during all flight modes and conditions (LOS
and NLOS) air to air, air to ground and in the presence of jamming and other countermeasures.
Aircraft must have joint, combined arms, and multinational force interoperable communications
(voice, data, and imagery) during all flight modes. On-board communications must possess a
low probability of intercept, provide a jam-resistant capability, and be hardened against virtually
any source of electronic countermeasures, and operate in both secure and non-secure modes.
The existing ATS organizational structure does not fully provide the capability to perform the
increasingly complex airspace management mission and has limited capability to perform the
airfield management mission.

c. Linkage to AUTL: ART 1.1 (Support to Situational Understanding); ART 1.3 (Conduct
ISR); ART 7.2 (Manage Tactical Information); ART 7.3 (Assess Tactical Situation and
Operations); ART 7.4 (Plan Tactical Operations); ART 7.5 (Prepare for Tactical Operations);
ART 7.6 (Execute Tactical Operations); ART 7.8 (Conduct Continuous Operations); ART 8.0
(Conduct Tactical Mission Tasks and Execution)

d. Linkage to UJTL: OP 2 (Provide Operational ISR); OP 5.4.4 (Synchronize and Integrate
Operations); OP 6.1.3 (Provide Airspace Control); TA 2.4 (Disseminate Tactical Warning
Information and Attack Assessment).

4-27. FOC 04-05: Mounted Vertical Maneuver.

a. Capstone Capabilities.

- Vertically lift, maneuver to extended distances, and vertically emplace future
  combat system (FCS) vehicle sized loads in close proximity to the AO.
- Vertically lift, maneuver, and vertically emplace other future force systems and
  material.
- Self-deployable system capable of conducting shipboard operations in the theater.

b. Narrative. With manned and unmanned air maneuver assets, future forces will possess
the capability to conduct vertical envelopment and air assault with mounted and dismounted
elements during tactical and operational maneuver. When executed rapidly, vertical maneuver
gains positional advantage, exposes enemy capabilities to destruction across the JOA, and
dislocates enemy forces. The inability to conduct mounted vertical maneuver with FCS sized
loads, and current heavy lift aircraft's reliance on prepared landing surfaces reduces the
flexibility and responsiveness of the Unit of Action. Future forces must be capable of vertically
lifting, maneuvering, and emplacing FCS and Stryker class vehicles, personnel, and other future
force materiel in close proximity to the AO, and of repositioning Stryker and FCS-equipped
forces in-depth from operational distances to within tactical striking distance of the enemy.

    c. Linkage to AUTL: ART 2.2 (Conduct Tactical Maneuver); ART 2.3 (Conduct Tactical Troop Movements); ART 6.1 (Provide Supplies); ART 6.4.3 (Conduct Aerial Delivery Support).

    d. Linkage to UJTL: OP 1.1 (Conduct Operational Movement); OP 1.2 (Conduct Operational Maneuver and Force Positioning); OP 1.3 (Provide Operational Mobility); OP 4.4.4 (Reconstitute Forces); TA 1.1 (Conduct Tactical Airlift); TA 1.2.1 (Conduct Air Assault Operations); TA 4.2 (Distribute Supplies and Provide Transport Services).

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Section V – Line of Sight/Beyond Line of Sight, Non-Line of Sight Lethality for Mounted/Dismounted Operations

Fires are categorized as LOS, BLOS, or NLOS. Engagement range is not directly tied to the definitions of LOS, BLOS, and NLOS fires. The method used determines the type of engagement. Future Force fire control and distribution requires networked responsive fires on-demand, engaging complex and simultaneous target sets, executed as preplanned or opportunity engagements. Capabilities envisioned for fires in Joint and Army concepts are:

- Line of Sight/Beyond Line of Sight (LOS/BLOS) lethality that provides the Future Force networked, responsive fires of extended range and precision munitions, to destroy and/or neutralize the adversary and their capabilities, at any time, and in any place, while minimizing fratricide and noncombatant casualties.

- Non-Line of Sight (NLOS) lethality for fires and effects that extend seamlessly, from tactical to operational distances, with no gaps in coverage, or loss of timeliness; with advanced, automated fire control and distribution means to sort out high payoff and most dangerous targets rapidly in depth.

4-28. Joint/Army Concept Linkage. The Force Application Joint Functional Concept and the Army Fires and Effects Functional Concept emphasize that Army and joint forces must be able to operate at will within all domains in order to enable engagements across the depth and breadth of the battlespace. Forces must possess combinations of stealth, speed, information superiority, connectivity, protection, and lethality to enable maneuver. They must also have the use of kinetic and non-kinetic means to generate the desired lethal and/or non-lethal effects. The LOS/BLOS/NLOS Force Operating Capabilities identify requirements envisioned in Joint and Army concepts.

4-29. Desired LOS/BLOS/NLOS Capabilities. Capabilities envisioned for fires in joint and Army concepts fall into the following areas:

- Line of Sight/Beyond Line of Sight (LOS/BLOS) Lethality.
- Non-Line of Sight (NLOS) Lethality.

4-30. FOC-05-01: Line of Sight/Beyond Line of Sight (LOS/BLOS) Lethality.

   a. **Capstone Capabilities.**

      (1) Fires are categorized as LOS, BLOS, or NLOS. Engagement range is not directly tied to the definitions of LOS, BLOS, and NLOS fires. Thus, the method used, rather than the range, determines the type of engagement. However, as a general guideline, LOS engagements occur at a maximum range of 5 km, BLOS engagements occur up to 16 km. Some Future Force combat systems may have the ability for more than one method (e.g., LOS and BLOS). Fire control and distribution requires responsiveness with fires on-demand to engage complex and simultaneous target sets executed as preplanned or opportunity engagements. Future Force combat systems

must be capable of automated precision engagements, with automated fire control, and distribution and clearance procedures with a manual backup. Future Force combat systems must be capable of precision, cooperative, and autonomous/designate LOS and BLOS; and be able to defeat helicopters and UAVs.

(2) The Future Force must possess the capability to destroy and/or neutralize the adversary and their capabilities, at any time, and in any place, while minimizing fratricide and noncombatant casualties. At the UA level, the lethality capabilities must provide for extended range lethality overmatch. These capabilities will be centered on direct LOS and BLOS fires, aided by joint and fused fire support multieffects, to include nonlethal. The Future Force seeks not only to attain decisive weapon system-of-systems lethality overmatch, but also to achieve comprehensive operational advantages in battle command, tactical maneuver and mobility, maneuver sustainment, maneuver support (MS), and FP. These advantages permit the application of precision engagement and dominant maneuver. Aggressive, adaptive, situationally aware leaders, highly trained, multifunctional Soldiers, coupled with the massing of lethal fires and precision effects, are fundamental to obtaining and maintaining this full spectrum overmatch. Every element in the warfighting formation must be capable of contributing to the long-range projection of dominant combat power, throughout the depth of the battlespace, as prescribed by the maneuver commander. Extended range lethality LOS/BLOS overmatch with improved fire control is a key component required for all potentially hostile operations, and provides the means to achieve decisive operations, freedom of maneuver, and FP in highly volatile, distributed environments.

(3) Line of Sight Fires are direct fires from mounted, dismounted, air-ground and unmanned system-of-systems optimized for the offense. Line of Sight is the traditional form of fire used by assaulting elements, as they conduct fire and movement to close with and destroy an enemy. The target in a direct LOS engagement is not masked from the Soldier manning the weapon. The sensor, shooter, and decider are all resident with the combat system engaging the enemy target. Line-of-sight fires characterize most dismounted weapons, and weapons employed by elements in the assault; they have the advantage of 'Point and Shoot' immediacy against targets that can be directly seen, or sensed, from the combat platform. Point and Shoot is a subset of Cooperative Engagement, and allows a Soldier or platform to designate a target for engagement by another platform in the same echelon. Point and Shoot implies the immediacy of effects, and occurs within the same echelon. Immediate in this construct is highly responsive (5 seconds or less) first round effects against the target. Mounted and dismounted elements possess Point and Shoot capability to designate targets they cannot engage with organic weapon systems. This capability is networked such that a sensor-to-shooter relationship results in responsive and precise fires. The masking effects of terrain, however, limit both the range and fields of fire available for LOS engagements. Line of sight fires are specially designed to support fire and maneuver, tactical assault, and actions on contact. Key required capabilities are rapid KE gun firing capability with high rate of fire; to quickly kill multiple moving and stationary targets with increased accuracy and stowed kills; overmatch at extended ranges; hunter-killer relationships between systems; and ability to fire first, with improved first-round kill.

(4) Beyond line of sight fires are fired over the horizon from systems optimized for LOS, and will be employed at extended ranges, out to 12-16 km for ground, and 16-20 km for aerial engagements. Beyond line of sight is an extension of the traditional direct fire. Direct fire BLOS enables standoff engagements at greater ranges, and also opens up fields of fire previously denied to elements, due to the restrictions of intervening terrain. Beyond line of sight fires permit UAs to conduct mutual support and cooperative engagements between platoons, companies, and battalions. To achieve direct fire BLOS, the Soldier or crew exploits mobile or other sensors, organic to their echelon, to extend their direct vision of the battlespace. Advanced sensor capabilities networked to Soldiers and crews enable target acquisition, identification, and engagement, without LOS visual confirmation. This allows the direct fire method to be employed, with munitions that fly over terrain masking. The extension of direct vision, combined with weapons capable of firing both LOS and BLOS, permits the Soldier or crew to close with the enemy. Furthermore, it permits engaging targets in the offense, at greater standoff range. Maneuvering platforms possess the capability to exploit targeting information, generated from external sensors, and available on the COP of the battlefield, to further enable direct LOS and BLOS engagements. Beyond line of sight fires allow the combat battalion's fighting teams and systems to use terrain masking for protection. Acquisition, delivery, and control are done organically in small tactical units, and fires are delivered by ground or air systems. Since BLOS fires are a backup to NLOS systems, they attack most dangerous or high payoff targets, and provide mutual support and over watching fires. Beyond line of sight fires must be capable of high angle fire, to overcome the restrictive nature of complex and urban terrain. Future Force lethality capabilities will include reactive counterfire, conducted by UAs equipped with organic, networked, target acquisition for immediate response. The dismounted platoon will have a BLOS capability able to kill an armored vehicle with Explosive Reactive Armor and an Active Protective System.

b. Narrative.

(1) The Future Force must generate dominant lethality overmatch across the full spectrum of operations, particularly in urban and complex terrain environments. The Future Force will harness a balance of organic direct fires, LOS and BLOS, and joint and Army fire support capabilities, to ensure the success of early entry, forced entry (opposed/unopposed), shaping, decisive offense/defense, and SASO. By orchestrating and synchronizing in real time this diverse and versatile mix of fires and integrated effects capabilities, the Future Force can rapidly set the conditions to overwhelmingly defeat enemy conventional forces, and asymmetrical threats, in all environments.

(2) The Future Force will have the required direct fire capabilities to dominate and extend the close combat battle to BLOS. These capabilities will include real-time target detection and identification, together with the ability to conduct a first strike/kill beyond the range of threat direct fire systems. Future Force combat systems will also a predictive and standoff detection capability against dismounted enemy forces. This requires employment of intelligent 'assistants', throughout the force, that are able to quickly correlate, and employ, artificial intelligence-based learning algorithms to compare new data to a historical repository for pattern and predictive profiling.

(3) Combat maneuver systems in the Future Force will have onboard weapons, equally effective in immediate LOS and BLOS point engagements. In order to exploit these weapons, the crews onboard these system-of-systems will extend their direct vision to BLOS by linking to the 'GIG', as well as by employing their own organic sensors. The result is that the Future Force's maneuver systems, exploiting the suppression effects from the force's organic fire support systems and joint fires, will initiate the direct close combat fight from BLOS. They will then seamlessly transition into LOS engagements, to ultimately bring about the defeat of an enemy force and seize the objective. Manned and unmanned system technologies will permit the Future Force to maintain its lethality overmatch/standoff advantage in urban operations as well.

(4) The Future Force will possess a wide range of organic and highly deployable fire support systems that are able to deliver advanced and fused fire support effects out to operational distances. Together with joint fires, these organic fire support capabilities will generate an efficient and dominant suppression umbrella of multieffects (e.g., nonlethal, EW, fire support, counter IO, etc.) that maneuver elements can exploit to gain positional advantage. This fusion of fire support effects will permit the Future Force to conduct decisive maneuver, and cause the rapid disintegration and destruction of enemy forces of significantly larger size, without having to employ attrition techniques. These same advanced fire support capabilities will have the range, versatility, and flexibility to protect combat support (CS) and CSS elements, throughout the depth of the extended and nonlinear battlespace, to include protection from enemy long-range precision missiles.

(5) The Future Force must apply an underlying knowledge of the culture extant in the OE. In determining effects of applied fires, the enduring impact of those fires on the society and the likely behavior that will result must be considered.

c. Linkage to AUTL: ART 2.4 (Conduct Direct Fires); ART 3.1 (Decide Surface Targets to Attack); ART 3.2 (Detect and Locate Surface Targets); ART 3.3 (Employ Fires to Influence the Will and Destroy, Neutralize, or Suppress Enemy Forces); ART 8.0 (Conduct Tactical Mission Tasks and Operations); ART 8.1 (Conduct Offensive Operations); ART 8.2 (Conduct Defensive Operations); ART 8.5 (Conduct Tactical Mission Tasks); ART 8.5.1 (Attack By Fire an Enemy Force/Position); ART 8.5.2 (Block an Enemy Force); ART 8.5.3 (Breach Enemy Defensive Positions); ART 8.5.5 (Canalize Enemy Movement); ART 8.5.10 (Defeat an Enemy Force); ART 8.5.11 (Destroy a Designated Enemy Force/Position).

d. Linkage to UJTL: OP 1 (Conduct Operational Movement and Maneuver); OP 3 (Employ Operational Firepower); TA 3 (Employ Firepower).

4-31. FOC-05-02: Non-Line of Sight (NLOS) Lethality.

a. Capstone Capabilities.

(1) Extended range NLOS lethality overmatch is a key component required for all potentially hostile operations, and provides the means to achieve decisive operations, freedom of maneuver, and FP in highly volatile, distributed environments. Capabilities for NLOS fires and effects must extend seamlessly, from tactical to operational distances, with no gaps in coverage,

or loss of timeliness. Advanced, automated fire control and distribution means must sort out high payoff and most dangerous targets rapidly in depth, amongst the vast array of threat intelligence. Aerial platforms add an accurate and immediate third-dimensional sensor and shooter capability to the building fight.

(2) Future Force combat systems must be capable of automated precision engagements, with automated fire control, and distribution and clearance procedures, with a manual backup. Future Force combat systems must be capable of precision, cooperative, and autonomous NLOS fires. Future Force combat system sensor-to-shooter linkages enable lethal overmatch, by engaging enemy target sets, near-instantaneously in seconds, using automated, semi-automated, or manual fire control and distribution procedures; and provide automated target identification, to reduce latency in providing effects. Structurally, and throughout the network, sensor-shooter relationships begin at the squad and platoon level, to direct effects from internal tactical-level elements, supporting operational-level forces, and joint assets, with unprecedented speed and accuracy. Networked fires facilitate clearance of fires, and discern high payoff and most dangerous targets rapidly, in depth, while static or moving, and direct the most appropriate fires to destroy them. Timely, accurate battle damage assessment (BDA) is required to ensure intent of the fires has been achieved, and to reduce the consumption of Class V, a major contributor to logistics footprint. Ground-based, long-range precision engagement is required to complement joint counter-precision and counter-antiaccess capabilities, and is particularly important for entry operations, and to shape the battlespace.

(3) Every element in the warfighting formation must be capable of contributing to the long-range projection of dominant combat power, throughout the depth of the battlespace, as prescribed by the maneuver commander. The operational-level Future Force will be the focal point for the continuous integration of networked NLOS fires. The operational-level Future Force will orchestrate continuous shaping operations, with extended-range precision fires, selected air-ground maneuver operations, and the full range of Army and joint capabilities. The process of shaping will set conditions for follow-on tactical engagements, or battles. Among the most critical shaping tasks will be achieving favorable force ratios to enable tactical maneuver. The operational-level Future Force isolates the battlefield, by employing fires to eliminate an enemy's ability to synchronize action, by attacking mobile reserves, or by blinding the enemy through the disablement of their C2 capabilities. Shielding fires include the capability to eliminate the enemy's long-range precision fires. To accomplish these tasks, the operational-level Future Force requires 'reach' to joint sensors and fires, and organic precision, extended range fires capabilities, linked to precise sensors. Future Force echelons must be provided with capabilities for long range shaping and interdiction. Of particular importance, is the ability to destroy the enemy's long-range ballistic and cruise missiles, rockets, artillery, mortars, UAVs, and command systems. Future Force will have organic capabilities to conduct long-range strike, or temporarily influence operations within the units of employment (UEs) operational area. Future Force Fires elements, located with the operational-level, will provide a broad array of lethal and nonlethal precision munitions, with ranges extending beyond 40 km.

(4) Future Forces must have an organic ability to deliver destructive fires, point and area, protective and suppressive fires, in quantity and duration, and special munitions, such as obscurants, illumination, and obstacles, in a fully networked architecture. Tactical-level Future

Forces have an unprecedented capability to fully integrate fires and maneuver. The tactical-level Future Force employs responsive and effective fires to enable maneuver, to rapidly move to positions of advantage. From positions of tactical advantage, the tactical-level Future Force employs destructive fires, with great precision at extended ranges, against High Payoff Targets (HPTs), in order to eliminate enemy combat capabilities at decisive points, or centers of gravity. Prior to forces being joined, the increased long-range killing capability of fires will be employed, to fix and destroy the enemy. By achieving greater destruction at standoff, fires ensure freedom of action and maneuver. Fires will dislocate, disintegrate, or destroy the enemy, creating the opportunity for maneuver to transition to exploitation, or move to other positions of advantage. Once contact occurs, fires will remain fully integrated with maneuver. To enable this, fires must be continuously available on demand, tailored to mission requirements, and scaleable to achieve the desired effects. Fires will continue to be employed against HPTs. However, the tactical-level Future Force has significantly improved ability to respond, with fires, to those enemy forces and systems that present themselves as 'most dangerous' targets, demand an immediate response, or face unacceptable risk at the lowest tactical echelon. If required, the tactical-level Future Force conducts tactical assault, while leveraging all combined arms fires, to achieve the destructive effects that lead to decisive outcomes.

(5) Fires must be reliable, timely, and accurate—able to sustain rates of fire and rates of kill continuously—and available in all weather and terrain conditions. Future Force organic fires must be able to deliver effects, at extended ranges beyond 40 km, to deny sanctuary in the OA. They must provide mutual support from dispersed locations, rapidly shift striking power across the battlefield, and apply the full range of effects—from precision discrete to area—to assure mission end state. Fire support must be agile to support forces in contact. It must provide greater target location, and weapon delivery accuracy and rates of fire, to get the job done quicker, with smaller firing teams, and with less exposure; as well as rapidly deliver scaleable munitions effects to destroy, disintegrate, or dislocate enemy forces. Fire support must have the ability to shift fires and mission types very quickly (destructive, protective and suppressive, and special purpose).

(6) Destructive fires include precise or area fires, to shape engagements by striking the enemy before forces are joined. Destructive fires are also employed in conjunction with direct fires, after forces are joined, to present the enemy with multiple lethal challenges. Destructive fires are employed to enable tactical maneuver. These include precise or area long-range fires, Army and joint, to deliver killing blows on enemy capabilities, such as mobile frameworks, indirect fire, and air defense assets, C4ISR, support systems, etc. Destructive fires may also be employed in combination with maneuver, to gain synergistic effects, and present the enemy with multiple, lethal problems to enable tactical maneuver.

(7) Protective and suppressive indirect fires may be lethal or nonlethal fires in close support of tactical maneuver. These include suppression, to fix or isolate an enemy, and prevent them from emplacing accurate lethal fires on the formation; obscuration or screening smoke to preclude observation by enemy, and protection of friendly flanks with smart mines. Protective fires may be lethal or nonlethal, and are oriented on the friendly force in order to facilitate our ability to maneuver. Ultimately, protective fires may include danger-close missions and final protective fires. Suppressive fires also protect friendly forces, but are oriented on proactively

attacking targets, such as enemy indirect fires or air defenses. Suppressive fires may be employed to facilitate ground maneuver, and the employment of Army or joint aviation assets. Inaccurate or unconfirmed target locations may dictate the employment of suppressive fires.

(8) Special purpose fires add to full spectrum capability. These fires may include munitions that provide obscurants, multiple means of illumination, countermobility capabilities, thermobaric effects, incapacitation, and munitions that blind, or disable, enemy acquisition and observation.

(9) Networked fires change the dynamics of indirect fire support. Networked fires are the triad of relevant sensors, effects capabilities, and battle command that enables dynamic application of lethal and nonlethal destructive and suppressive effects, to achieve the commander's tactical and operational objectives. Networked fires are a component of the battle command construct, and supporting communications architecture. This network capability enables the dynamic application of the tactical-level Future Force commander's intent for the employment of fires and effects at the time and place of the commander's choosing. Networked fires are fully integrated from theater to platform, allowing it to rapidly establish, alter, and terminate linkages to all relevant sensors and LOS, BLOS and NLOS, external and joint systems, with a wide set of lethal and nonlethal effects. The network allows the tactical-level Future Force commander to dynamically tailor guidance, and refocus and task sensors and effects capabilities, to meet the requirements of changing situations.

(10) With all elements fully networked, the Future Force can achieve virtual teaming, mutual support, and the ability to rapidly mass effects when required, without massing forces. Networked fires enable detection, delivery, and assessment, in near real time, with every platform and Soldier having the ability to be a sensor. The network is capable of rapid fusion of sensor inputs to produce targetable and protected target data. It is also capable of routing and rerouting of targeting data to sensors or shooters, when established sensor-to-shooter linkages become inappropriate. Networked fires balance the need for responsiveness against producing tactical solutions, with the most effective application of systems and munitions. It facilitates rapid clearance of fires and airspace coordination. NLOS/BLOS fire sensors should be linked to full spectrum CBRN sensors to increase sensitivity and intelligence gathering capabilities.

(11) Networked fires is a system-of-systems that will provide future commanders a real-time capability to apply full dimension effects solutions, across the battlespace. It is fully integrated and interdependent with Army, joint, multinational, and interagency sensors, effects-generating systems and capabilities, and IT systems. Networked fires is a purpose-oriented, execution-focused, networked capability optimized to provide a broad range of lethal and nonlethal effects, against enemy decisive points and centers of gravity, in concert with maneuver and support operations. It enables the commander to dynamically apply fires and effects, on demand, to any echelon, in support of combined arms and joint operations, in any operating environment.

(12) Teaming by ISR and indirect fire systems, dispersed throughout the battlespace, and by small tactical units fully integrated with maneuver, is critical. A system-of-systems framework must achieve the requirements for such a capability. It is critical that an enabling,

integrated networked fires system-of-systems solution, leveraging a wider set of capabilities, including sensors, C2, and attack means from Army, joint and multinational forces, be pursued to provide the operational capability required today, and in the future. Protective fires can also support maneuver by suppressing enemy air defenses, and countering the fires from enemy indirect fire systems. Close support may involve danger-close missions and final protective fires that are designed to bring fires especially close to maneuver formations for ultimate protection.

(13) Special purpose fires include artillery raids, illumination of enemy positions, and neutralization of minefields with NLOS-delivered thermobaric effects. Future Force NLOS lethality capabilities will include:

- Centralized planning of fires and effects that fuses sensors, effects capabilities, and battle command.
- Automated coordination and deconfliction in all dimensions.
- Capability to mass fires, without having to mass the units themselves.
- Sensors providing target acquisition, at extended ranges and sufficient target location accuracy, permitting the networked fires system to rapidly optimize target-weapon pairing and rapid delivery of effects.
- Advanced fire direction, extended ranges, and position locating and orientation capabilities, to enable firing systems to be highly dispersed, and permit the conduct of fire missions by single platforms.
- All-weather, all-terrain fires, enabled by pervasive, redundant target acquisition and ISR means:
  - High-angle fires to engage targets, while overcoming the restrictive nature of terrain.
  - Brilliant and precision munitions.
  - Improved nonlethal effects.
  - Preemptive counterfire.

(14) The traditional roles of indirect fire—strike, close supporting fires, and special fires—remain relevant for Future Force NLOS lethality. These roles require 24-7, adverse weather, all-terrain, all ROE availability, volume, and rate of fires for:

- Suppression of enemy activities for extended duration, as ground maneuver force conducts movements to positions of advantage, and conducts final decisive assault.
- Isolation of the battlefield once forces are joined, by eliminating an enemy's ability to synchronize actions, and by attacking mobile reserves, or C2.
- Shielding critical assets or population centers from enemy long-range fires.
- Simultaneous, multi-target set engagement.
- Continuous integration of fires and maneuver, by providing precise or area fires before forces are joined, obscuring enemy observation capabilities, protecting friendly flanks, suppressing enemy air defenses, and countering enemy indirect fire systems.
- Obscuration effects over wide areas, for extended periods, to support ground maneuver.

- Close support of ground maneuver force in contact with the enemy, including danger-close missions, and final protective fires.
- Special tasks of illumination during night operations, emplacing minefields, attacking and neutralizing enemy networks and C4ISR systems, and other nonlethal effects.

(15) The Future Force must have the capability to provide networked, extended-range fires for precision attack of point and area targets, in support of the Future Force brigade/UA, with a suite of munitions that include special purpose capabilities, including precision munitions with course correction capabilities. The capability must provide sustained fires, both in quantity and duration, for close support and destructive fires for tactical stand off engagement. These fires must readily available 24 hours a day, in all terrain, and under all weather conditions. The system's primary purpose will be to provide responsive fires in support of Combined Arms Battalions and their subordinate units, in concert with other LOS, BLOS, NLOS, external, and joint capabilities. The system provides flexible support through the ability to change the effects round-by-round, and mission-by-mission. These capabilities, combined with rapid response to calls for fire and rate of fire, provide a variety of effects on demand. Indirect fires systems will be capable of dispersed platoon or lower level operations. Cannons offer a wide range of trajectory options, from direct fire to high angle, to support the diversity of the operating environment. Additionally, precision munitions, with course correction capabilities, must be accelerated for incorporation into Future Force cannon munitions, Future Force mortars, and NLOS LS.

(16) Future Forces must have the capability of launch system that provides networked, extended-range targeting and precision attack of armored, lightly armored and other stationary and moving targets during day, night, obscured, and adverse weather conditions. The system's primary purpose is to provide responsive, precision attack of HPTs in support of the tactical-level Future Force, in concert with other Future Force NLOS, external, and joint capabilities. The system also provides 'discriminating' capability via automatic target recognition, and limited BDA. The launch system will permit the Future Force to shape and isolate the battle space by destroying enemy forces out of contact. It provides precision destructive and protective/suppressive fires, while avoiding noncombatant casualties, and minimizing collateral damage. It provides close supporting fires for friendly forces joined in contact, enabling freedom of action, while denying options to the enemy. It also provides a counter-air capability, to accurately destroy low and slow moving enemy aircraft and enemy UAVs through the use of onboard munitions.

(17) Future Force mortars, with precision munitions, must provide added capability to attack targets precisely in support of the close fight. Mortars provide responsive, sustained fires in support of the Combined Arms Battalion and subordinate companies. These fires provide complementary capabilities to the other Future Force NLOS systems. Mortars provide the ability for continuous operations, in all weather and terrain conditions. They also provide destructive fires that complement maneuver, by destroying targets of opportunity with precision-guided fires. Mortars provide responsiveness, with on-demand fires to engage complex and simultaneous target sets; protective fires for overwatch, screen and final protective fires; suppressive fires for suppression and obscuration; special fires that provide illumination (white

and infrared) and nonlethal. The destructive, protective, suppressive, and special fires are for close support of maneuver units. Guided long-range rocket munitions must be accelerated to enable engagement at the upper end of NLOS range requirements. Existing rocket systems must be upgraded, to incorporate the C3 within the networked fires of the Future Force. Networked fires must be accelerated in concept and development; and networking links to Army aviation and other joint fires platforms are required. Development and procurement of new nonlethal effects must be accelerated. Finally, reconnaissance and surveillance assets, including joint assets and UAVs, must provide acceptable target location accuracy. All these capabilities must be nested in the networked architecture that allows Future Forces to rapidly pair joint and Army sensors, delivery systems, and munitions to the needs of the moment, and the demands of the supported force.

b. Narrative.

(1) Army forces dominate land operations by employing fires and maneuver, during combat operations, to accomplish the task of controlling the ground environment, its populations, and enemy centers of gravity. Fires enable maneuver, and maneuver enables fires—there is a symbiotic relationship between these elements that demands synchronization and integration, if the commander is to achieve maximum effectiveness. Non-line of sight fires will play an ever-increasing role in support of maneuver, as The Army transitions to the Future Force. New enhanced capabilities will provide the ability to routinely destroy and disorganize enemy formations at extended ranges, before forces become engaged in close combat. Non-line of sight indirect fires are higher trajectory fires, that emanate from both inside the maneuver commander's formations (mortars, cannons, some rockets), and from supporting elements (cannons, rockets, missiles, attack helicopters, high performance fixed wing aircraft, etc.). It is the ground maneuver commander's responsibility to synchronize the maneuver elements with all available direct, indirect, organic, and joint fires. To set the maneuver conditions, commanders must be able to employ destructive, suppressive (area suppression missions against imprecise or fleeting targets, to fix them, and keep them from maneuvering), and protective (smoke, artillery delivered mines, illumination for night operations) fires to facilitate maneuver in the close battle. Non-line of sight fires must provide responsive—immediately available on demand, timely, continuous, unhampered by terrain, 24 hours a day, all weather—fire support. These fires must be agile and flexible enough to fire on multiple, disparate, disconnected, point, and area targets, simultaneously. Networked fires must provide greater access to other Army, joint, and multinational fires.

(2) Non-line of sight fires must provide mutual support, by virtually teaming dispersed systems to mass effects, as needed, and be agile enough to shift quickly over an expanded battle space. Fires must be tailorable to meet the demands of mission and effects, whether destruction at depth, or support of the assault. In either case, missions must be achieved under a widely varying set of environmental and threat conditions. To achieve the requisite effects, fire support must provide accurate target locations and munitions that are delivered responsively and accurately. The ultimate lethality of fires is a function of munitions' effects, discrete or volume of fires, target location and weapon delivery accuracy, and response time, from target detection, to assessment of effects. While the roles of NLOS fires have evolved over time, there have been some constants. Today, there are three major roles that NLOS fires routinely provide, in support

of maneuver brigades at the tactical level. Each of these roles is critical in enabling and retaining freedom of maneuver, through suppression or destruction of enemy forces, or protection of U.S. Forces. These **enduring functions** are:

- First, to ***strike*** the enemy with killing blows prior to forces being joined in contact. This includes gaining the synergistic effects of combining BLOS and NLOS fires to present the enemy with multiple, lethal problems to enable tactical maneuver. Efforts are predominantly preemptive, to attack the enemy's total strike system-of-systems, including their mobile framework, indirect fire and air defense artillery, C4ISR, support systems, and logistics support areas.
- Second is ***close supporting fires***, to protect U.S. Forces through such means as suppression or obscuration of enemy forces and air defenses, isolate the current close fight, or counter fires to defeat enemy indirect fire systems, such as the mortars Al Qaeda forces used against the coalition in Operation Anaconda. This provides U.S. Forces freedom of action, while denying options to the enemy—absolutely critical to gaining and maintaining the initiative in any battle—and allows U.S. Forces to close with, and destroy, an enemy through assault. Danger-close missions, and final protective fires, are designed to bring fires especially close to maneuver formations for ultimate protection.
- Third are ***special tasks***, such as employing illumination during night operations, or emplacing minefields, and the use of other <u>nonlethal</u> effects.

These functions will not only endure, based on Future Force operational concepts, their importance will increase. Future Forces will have freedom of maneuver, and the ability to deliver killing blows, without having to become decisively engaged. Based upon situational awareness, and the connectivity of networked fires in support of tactical maneuver, the Future Force will be capable of greater destruction at standoff. In some cases, formations will be able to destroy the enemy, without having to tactical assault; however, UA will be exceptionally capable in the tactical assault supported by networked fires, when required to conduct tactical assault to achieve decision.

(3) The most demanding role for NLOS fires is support for the close fight, where forces are in immediate contact with the enemy, and the fighting between the committed forces and readily available tactical reserves of both combatants is occurring. The dynamic nature of the close fight demands very responsive and agile fires, to ensure maneuver and fires remain synchronized. Cannons, in direct support of maneuver, provide the ability to scale (through massing and number of rounds delivered) and tailor (through munitions selection) effects, to those required by the supported maneuver force. Additionally, cannons can most easily overcome changes in target environment conditions (minimization of collateral damage, target latency, target location accuracy, weather, terrain), by adjustment of fires, if required.

(4) The Future Force must orchestrate and synchronize a diverse and versatile mix of fires and fused effects capabilities in real time. It must rapidly set the conditions to overwhelmingly defeat enemy conventional forces and asymmetrical threats, in all environments and dimensions, including austere theaters of operations.

(5) The future force must apply an underlying knowledge of the culture extant in the OE. In determining effects of applied fires, the enduring impact of those fires on the society and the likely behavior that will result must be considered.

c. Linkage to AUTL: ART 3.0 (The Fire Support Battlefield Operating System); ART 3.1 (Decide Surface Targets to Attack); ART 3.2 (Detect and Locate Surface Targets); ART 3.3 (Employ Fires to Influence the Will and Destroy, Neutralize, or Suppress Enemy Forces); ART 7.2 (Manage Tactical Information); ART 8.0 (Conduct Tactical Mission Tasks and Operations); ART 8.1 (Conduct Offensive Operations); ART 8.2 (Conduct Defensive Operations); ART 8.5.1 (Attack By Fire an Enemy Force/Position); ART 8.5.2 (Block an Enemy Force); ART 8.5.5 (Canalize Enemy Movement); ART 8.5.10 (Defeat an Enemy Force); ART 8.5.11 (Destroy a Designated Enemy Force/Position).

d. Linkage to UJTL: OP 1 (Conduct Operational Movement and Maneuver); OP 3 (Employ Operational Firepower); TA 3 (Employ Firepower).

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Section VI – Maneuver Support

Maneuver Support forces focus on ensuring Future Force freedom of maneuver and protection throughout the theater of operation. Maneuver support capabilities are applied within operating areas, fully integrated within combined arms teams, to ensure continued friendly freedom of action and denial of enemy freedom of action. On a noncontiguous, three-dimensional battlefield, the idea of "maneuvering" fires, sensor networks, distribution based sustainment and communications networks broadens the applications of maneuver support capabilities. Maneuver support provides a wide range of integrated actions, both proactive and defensive, that support uninterrupted momentum, allow maneuver forces to preserve combat power so that it may be best applied at decisive points and times, and foster rapid transitions in operations. Capabilities to enable Maneuver Support concepts are:

- Provide assured mobility.
- Deny enemy freedom of action.
- Engage and control populations, including EPW and other detainees.
- Employ Non-lethal Effects.
- Detect and neutralize environmental hazards.
- Reduce environmental damage from military operations.
- Understand the Battlespace Environment.

4-32. Joint/Army Concept Linkage.

a. Maneuver support concentrates on two interrelated components: freedom of maneuver and protection. For a maneuver-based force, there is significant overlap and synergy between these two functions, with Maneuver Support assets, systems, and Soldiers capable of supporting both simultaneously.

b. Maneuver support takes on added dimensions and significance with the increasing emphasis on battlefield frameworks that encompass extended, dispersed, distributed, noncontiguous, and three-dimensional battlespaces and nonlinear operations, to include forcible and early entry operations and operational maneuver. In addition, the Army's vision of the operational environment recognizes that adversaries will apply a wide array of conventional and unconventional or asymmetric means to deny access to and movement of friendly forces, starting with their strategic deployment platforms and continuing within the theater of operations and in individual tactical battlespaces. The physical environment, to include terrain, infrastructure, weather, hazards, and the presence and dynamics of the local populace, will also affect any ground force, sometimes more than enemy actions will.

c. All of these factors create major challenges to the freedom of action and protection of the force. Without the proper maneuver support enablers, critical combat power must be diverted to facilitate and protect the movement of forces and sustainment elements to the operating areas (OA) where they will fight. Maneuver support capabilities are also applied within operating

areas, fully integrated within combined arms teams, to ensure continued friendly freedom of action and denial of enemy freedom of action. On a noncontiguous, three-dimensional battlefield, the idea of "maneuvering" fires, sensor networks, and communications networks broadens the applications of maneuver support capabilities. Maneuver support provides a wide range of integrated actions, both proactive and defensive, that support uninterrupted momentum, allow maneuver forces to preserve combat power so that it may be best applied at decisive points and times, and foster rapid transitions in operations. When applying maneuver support in military operations, commanders must consider the inherent economy of force offered by maneuver support, as well as unique risk mitigation features. Maneuver support enablers range from embedded capabilities to reach operations that include national assets. Maneuver support assets may include maneuver and sustainment elements as well.

4-33. Desired Maneuver Support Capabilities. Capabilities to fulfill the vision for maneuver support articulated in Joint and Army Concepts are identified in the following areas:

- Provide Assured Mobility.
- Deny Enemy Freedom of Action.
- Engage and Control Populations.
- Neutralize Hazards and Restore the Environment.
- Understand the Battlespace Environment.

4-34. FOC-06-01: Provide Assured Mobility

  a. Capstone Capabilities.

    (1) Assured Mobility includes all those actions that guarantee the force commander the ability to deploy, move, and maneuver, by ground or vertical means, where and when desired, without interruption or delay, to achieve the intent. The countermine and counter booby trap missions are both critical aspects of Assured Mobility. The fundamentals of Assured Mobility are: Predict, Detect, Prevent, Avoid, Neutralize, and Protect. These six fundamentals represent overlapping and concurrent tasks that must be accomplished, allowing the commander to mitigate impediments to mobility from standoff, and greatly reduce the likelihood of traditional breaching or neutralization requirements. Their application leads to: 1) Establish the Mobility COP; 2) Select, establish and maintaining the operating area; 3) Attack the enemy's ability to influence the operating area; and 4) Maintain mobility and momentum.

    (2) Required capabilities to achieve Assured Mobility include:

- Common Operational Picture for Mobility.

- Means to provide early warning for Soldiers, platforms, and forces, focusing on avoidance (i.e., mines and other obstacles, CBRN hazards, missiles, and air threats).

- Means to rapidly 'breach ahead' in open, restricted, and urban terrain.

- Means to rapidly cross wet and dry gaps.

- Means to execute self defense engagements against rotary wing, RAM, and UAV threats.

- Means to execute wide area engagements against fixed wing, cruise missile, short, medium and long range missile threats.

- Embedded, standoff, forward- and side-looking remote detection, and neutralization of hazards such as mines, booby traps, and IED.

- Detection from other platforms, at tactical and operational ranges.

- Route security and clearance (route reconnaissance and surveillance, LOC/main supply route regulation enforcement; river and obstacle crossings, and passage of lines) to include control and maintenance of LOCs to, and within, the AO.

- Circulation/traffic control measures.

- Visual and virtual obstacle marking system for point and area CBRN/hazardous material detection, decontamination, and hazard area marking.

- Computer-aided analysis, to enable prediction of enemy efforts to impede maneuver, based on terrain reasoning, threat capabilities, and employment patterns.

- Reach-back for technical expertise and enablers (i.e., Civil Affairs Functional Specialists).

- Area/route clearance at operating speeds.

- Rapid construction and repair of routes and trails.

- Trafficability enhancers.

- Ability to differentiate between IED explosive fillers and CBRN fillers at standoff distances.

- Ability to deploy and detect full spectrum CBRN markers during daylight, darkness, and adverse weather conditions.

- Ability to conduct personnel, equipment and area decontamination with standardized decontaminants.

- Ability to provide obscuration support to integrated Joint and Coalition operations.

- Ability to conduct area security and reconnaissance/counter reconnaissance operations.

- Ability to perform area damage control operations.

- Ability to perform based defense; critical site, asset and HRP security.

- Ability to provide force protection and physical security.

- Ability to conduct antiterrorism operations.

b. Narrative. The mobility of the Future Force is critical, to maintain the high tempo, and operate over the extended distances dictated by this concept. Assured mobility is one of several

key maneuver support enablers of the Future Force, and must be developed to its full potential. Assured mobility extends the concept of air corridor suppression of enemy air defense, to ground mobility routes, or corridors. A blanket of sensor coverage will encompass the selected course of action, allowing assured route mobility. Sensors will maintain current, updated SU, and sensor-effects links will preclude the enemy from modifying the current mobility situation. The current operational pictures will be fed continuously to commanders, and area denial systems will prevent enemy alteration. Future requirements for the ISR system include sensors that can distinguish between friendly, enemy, and civilian activities; integration of battlefield sensors; mobility decision aids; and denying enemy forces the opportunity to apply countermobility and surveillance measures.

c. Linkage to AUTL: ART 5.0 (The Mobility/Countermobility/Survivability Battlefield Operating System); ART 5.1 (Conduct Mobility Operations); ART 5.1.1 (Overcome Barriers/Obstacles/Mines); ART 5.1.1.1 (Conduct Breaching Operations); ART 5.1.1.2 (Clear Obstacles); ART 5.1.1.2.1 (Conduct Area Clearance); ART 5.1.1.2.2 (Conduct Route Clearance); ART 5.1.1.3 (Conduct River Crossing Operations); ART 5.1.2 (Enhance Movement and Maneuver); ART 5.1.2.1 (Construct/Maintain Combat Roads and Trails); ART 5.1.2.2 (Construct/Maintain Forward Airfields and Landing Zones); ART 5.2. (Conduct Countermobility Operations); ART 5.2.1 (Site Obstacles); ART 5.2.2 (Construct, Emplace, or Detonate Obstacles); ART 5.2.3 (Mark, Report, and Record Obstacles); ART 5.2.4 (Maintain Obstacle Integration); ART 5.3.5 (Conduct Security Operations); ART 6.3.1.3 (Conduct Maneuver and Mobility Support Operations); ART 8.5.4 (Bypass Enemy Obstacles/Forces/Positions).

d. Linkage to UJTL: OP 1 (Conduct Operational Movement and Maneuver); OP 1.3.1 (Overcome Operationally Significant Barriers, Obstacles, and Mines); OP 1.3.2. (Enhance Movement of Operational Forces); OP 1.4 (Provide Operational Countermobility); OP 6.2.13 (Conduct Countermine Activities); ST 1 (Deploy, Concentrate, and Maneuver Theater Forces); TA 1 (Develop/Conduct Maneuver); TA 1.3 (Conduct Countermine Operations); TA 1.4 (Conduct Mine Operations).

4-35. FOC-06-02: Deny Enemy Freedom of Action

a. Capstone Capabilities.

(1) Key to the success of the Future Force will be its ability to maintain an unprecedented level of freedom of maneuver at the strategic, operational, and tactical levels, in all environments. Equally as critical, is denying the enemy the freedom of action. Denying the enemy freedom of action includes proactive measures to leverage the physical environment to isolate enemy forces, deny key terrain, and deny, impede, or canalize enemy movement, in order to protect friendly forces and their freedom of action, and to place enemy forces in positions of disadvantage.

(2) Required capabilities include:

- Countermobility means to reinforce friendly fires (intelligent sensor/munitions fields, and the means to employ them).

- Terrain modification/obstacle emplacement capability, to fix enemy forces, or disrupt enemy operations.

- Effective isolation during Military Operations in Urban Terrain, and operations in complex terrain, to shield friendly forces, or fix enemy forces.

- Tunable on/off munitions; intelligent integrated sensor-munitions—tunable, positive on/off, identification of friend or foe (IFF), self-destruct, with standoff delivery.

- Sensor/effects packages, to deny access to critical points.

- Autonomous minefield/mine emplacement and/or recovery.

- Dynamic, self-healing minefields, and other 'obstacles on demand'.

- Non-lethal capabilities for point and area denial, trafficability, and traction reduction and counter-materiel.

- Jamming/C2 disruption.

- Decoys and other deception tools.

- Unmanned sensors capable of detecting full spectrum CBRN agents.

- Ability to provide data fusion from CBRN and disparate sensors.

- Ability to selectively obscure portions of the EM spectrum on demand.

- Ability to positively influence the attitudes, opinions, and behavior of specific populations to effect isolation of adversaries from popular support.

b. Narrative.

(1) This aspect of maneuver support focuses on enabling our maneuver commanders, and formations, to seize the initiative in achieving a position of decisive advantage, from the very outset, and sustaining the initiative throughout a campaign, operation, or engagement. However, the Future Force Commander will almost always face a threat that is empowered by the 'home court' advantage. The threat commander's intimate knowledge of the battlespace, and its effects (advantages and disadvantages), will give the threat commander the upper hand in maintaining freedom of maneuver—at least initially. The home court mobility advantage will be the centerpiece of the threat's adaptive strategies, to draw tactical formations into dangerous close combat situations where the threat has the opportunity to mass, attack, and then quickly disperse. The enemy's offensive tactical actions will be opportunistic. Surprise, combined with asymmetric capabilities, will frequently be a central theme in the design of the threat's tactical operations. To succeed, threat forces at all levels must maintain freedom of mounted, and dismounted maneuver, throughout the battlespace, particularly in urban and complex terrain, where the standoff/long-range precision fires of the Future Force may be degraded.

(2) At the strategic and operational level, denying enemy freedom of action is an integral part of shaping operations, with a chief aim of creating and/or sustaining opportunities for subordinate formations to achieve a position of advantage. At the tactical level, denying enemy freedom of action is more directly tied to shaping tactical engagements. Denying enemy freedom of action focuses on the employment of maneuver support organizations and assets, to achieve any combination of five specific effects: Deny Use of Facilities/Areas, Fix Enemy Forces, Disrupt Enemy Operations, Shield Friendly Forces, and Reinforce Fires. At all levels the Future Force must deny adversaries freedom of action by isolating them from popular support. From the strategic to the tactical level non-lethal fires positively effect public opinion and support for indigenous populations and institutions (IPIs) and/or Future Force actions.

(3) The ability to couple large area, nonlethal effects, with precision delivery from LOS, BLOS, and NLOS systems, will provide the Future Force with an improved range of options for precise and measured control of target effects, to avoid attrition warfare, and reduce noncombatant casualties. The Future Force will employ nonlethal capabilities, to attack, influence, isolate, co-opt, and/or neutralize the enemy's networks and C4ISR capabilities, prevent their ability to interfere with maneuver elements, provide for area and air space denial, and degrade the enemy's night fighting systems. Nonlethal capabilities are required to cause enemy hiding in defilade, cover, and concealment; or hiding amid the nonbelligerent populace, to have to move from hiding, and thereby be exposed to lethal effects.

c. Linkage to AUTL: ART 2.4.2 (Conduct Nonlethal Direct Fire Against a Surface Target); ART 3.0 (The Fire Support Battlefield Operating System); ART 3.1 (Decide Surface Targets to Attack); ART 3.2 (Detect and Locate Surface Targets); ART 3.3 (Employ Fires to Influence the Will and Destroy, Neutralize, or Suppress Enemy Forces); ART 5.3.5 (Conduct Security Operations); ART 5.3.5.7 (Employ Obscurants); ART 8.5 (Conduct Tactical Mission Tasks); ART 8.5.2 (Block an Enemy Force); ART 8.5.3 (Breach Enemy Defensive Positions); ART 8.5.5. (Canalize Enemy Movement); ART 8.5.8 (Contain an Enemy Force); ART 8.5.9 (Control an Area); ART 8.5.13 (Disrupt a Designated Enemy Force's Formation/Tempo/ Timetable); ART 8.5.15 (Fix an Enemy Force); ART 8.5.18 (Interdict an Area/Route to Prevent/Disrupt/Delay its Use by an Enemy Force); ART 8.5.19 (Isolate an Enemy Force); ART 8.5.20 (Neutralize an Enemy Force); ART 8.5.21 (Occupy an Area); ART 8.5.28 (Turn an Enemy Force).

d. Linkage to UJTL: OP 1 (Conduct Operational Movement and Maneuver); OP 3 (Employ Operational Firepower); TA 3 (Employ Firepower).

4-36. FOC-06-03: Engage and Control Populations

a. Capstone Capabilities.

(1) Population engagement is the ability to proactively provide the necessary control, over demographically diverse populations, to ensure maneuver, maneuver support, and maneuver sustainment forces are unencumbered in the conduct of their respective operations. Populations

are most often classified as enemy prisoners of war (EPWs), civilian internees (CIs), detainees, internal displaced persons (IDPs), refugees, stateless persons, war victims, evacuees, resident stay-put populations, or mass transiting civilian populations. They can also include IPI and key leadership (legitimate or otherwise).

(2) Capabilities must facilitate the Future Force commander's ability to conduct rapid and decisive combat operations; deter, mitigate, and defeat threats to populations that may result in conflict; reverse conditions of human suffering; and build the capacity of a foreign government to effectively care for, and govern, its population. This includes capabilities to conduct full-spectrum shaping operations to mitigate and defeat the underlying conditions for conflict and counter the core motivations that result in support to terrorist, insurgent, and other destabilizing groups.

(3) Required capabilities include:

- Population movement, collection, evacuation, and resettlement controls.

- Means to shelter, sustain, guard, protect, and account for EPWs, CIs, retained personnel, and other detainees.

- General engineering support to construct, maintain, and repair camps, facilities, and/or (necessary or essential) infrastructure for varying populations.

- Means to assist civil authorities to restore basic services, and critical infrastructure (e.g., 'prime power,' security, safety, utilities, etc.).

- Means to detect, track, and group populations into four broad categories, for identification and subsequent disposition:
  o EPWs, CIs, and detainees.
  o Resident populations, refugees, displaced persons, stateless persons, war victims, and evacuees.
  o Insurgent groups and organized crime syndicates.
  o Governmental, law enforcement, political, informational, military, economic, religious, and social leaders (legitimate or otherwise).

- Means to mitigate and defeat threats to civil society that may result in conflict; and establish Civilian-Military Operations Center (CMOC) operations.

- Means to generate and deliver PSYOP and counter-propaganda products at targeted populations.

- Interoperability with multinational organizations, IPIs, international organizations, NGOs, and other government agencies (OGAs), and control humanitarian assistance related to population movement.

- Proactive and nonlethal crisis responses to mitigate long-term negative impacts.

- Universal language translation capabilities.

- Biometrics for positive identification, detection, database recall, and intelligence fusion.

- Increased theater and battlefield access to worldwide police and intelligence databases.

- Analytical tools linked to Command and Control and Battlespace Awareness systems and processes for pattern analysis, to support PSYOP and Civil-Military Operations, and police/criminal intelligence efforts.

- Access Civil Information Management databases on civil infrastructure located in Civil Affairs CMOCs.

- Support the DOS Coordinator for Reconstruction and Stabilization.

- Means to fuse civil information with Command and Control and Battlespace Awareness systems to inform the COP and derive a common relevant operating picture (CROP).

b. .Narrative.

(1) Population dynamics are among the most destabilizing forces in the world today. In light of persistent armed conflict, and social turmoil throughout our multi-polar world, the effects on populations remain a compelling issue. Many cities are overwhelmed by an increasingly growing citizenry and the presence of rural refugees. The potential for instability in the largest cities is undeniable. The world population will increase, from 6 billion to 9 billion, in the next two decades, with 95 percent of the growth occurring in the developing world. By 2020, 60 percent of the world's population will live in urban areas. Coexisting, demographically, and ethnically diverse societies will aggressively compete for limited resources, such as individual freedoms, employment, economic benefits, clean water, productive soils, desirable living conditions, mature infrastructure, political autonomy, and natural resources. Typically, overpopulated third world societies suffer from a lack of legitimate and effective enforcement mechanisms—generally accepted as one of the cornerstones of a stable society. Stability within population eliminates the need for military intervention. The goal of the military conducting Populace and Resources Control is to provide stability within the population, its institutions, and its infrastructure. Only in the most advanced societies, where supporting governments make a genuine attempt to care for all of their diverse population groups, will the competition be less than chaotic. In this rapidly changing and dynamic operational environment, U.S. Forces will compete with local populations for the same space, routes, and resources. As displaced noncombatant populations create an increased demand for humanitarian assistance resources, the control of their movement and activity is expected to exceed the capability of foreign-nation, international organization's, NGO's, and OGA's means. The likelihood for uncontrolled populations to impede U.S. military operations is always present, and can overwhelm an advancing force. Ultimately, the swelling number of competing groups creates an environment conducive to interference with maneuver, MS, and maneuver sustainment forces. The Future Force's ability to positively influence and shape the opinions, attitudes, and behaviors of select populations is critical to tactical, operational, and strategic success.

(2) An adaptive enemy will manipulate populations, hostile to our intent, by instigating mass civil disobedience, directing criminal activity, masking their operations in urban and complex terrain, maintaining an indistinguishable presence through cultural anonymity, and actively seeking the traditional sanctuary of protected areas, as defined by the rules of land warfare. Such actions will facilitate dispersal of threat forces, negate technological overmatches, and degrade our targeting opportunities. Therefore, employment concepts will include leveraging technology to influence and control populations, maximizing use of ISR sensors and combat identification friend, - foe, - neutral (CIFFN) to differentiate between combatants and noncombatants, and friendly forces from threat forces, evacuating and resettling EPWs and CIs, and conclusively transitioning humanitarian assistance operations to other functional agencies. The (UA) commander can mitigate, or defeat, threats to civil society, by conducting cooperative operations with multinational organizations, international organizations, NGOs, OGAs, and IPIs. These represent the aggregate of the people, organizations, and structures that comprise an operational area's governmental, political, informational, military, economic, religious, and social systems. The operational benefits are realized by employing MS enablers, from UE force pools, to set the conditions that unburden the military commander, prevent uncontrolled population movement or action from influencing the commander's maneuver, and enabling an unconstrained attack, without fear of friendly or noncombatant interference.

(3) Cultural awareness will enable the commander to plan - and the Soldier to operate - in a manner designed to minimize the friction that results from the interaction of differing societies and cultures. The ability to understand and adapt to the cultural norms of the population in the operational environment (OE) is a necessary component of battlespace awareness. Appropriate consideration of culture can facilitate maneuver throughout the OE, while the opposite will almost certainly have a negative impact of the future force's freedom of maneuver and force protection.

c. Linkage to AUTL: ART 2.4.2 (Conduct Nonlethal Direct Fire Against a Surface Target); ART 6.10.3 (Provide Engineer Construction Support); ART 6.13 (Conduct Internment and Resettlement Activities); ART 6.13.1 (Perform Enemy Prisoners of War/Civilian Internment); ART 6.13.2 (Conduct Populace and Resource Control); ART 6.14 (Conduct Civil-Military Operations); ART 6.14.1 (Provide Interface/Liaison Between U.S. Military Forces and Local Authorities/Nongovernmental Organizations); ART 6.14.2 (Locate and Identify Population Centers); ART 6.14.3 (Identify Local Resources/Facilities/Support); ART 6.14.4 (Advise Commanders of Obligations to Civilian Population); ART 6.14.5 (Resettle Refugees and Displaced Civilians); ART 6.14.6 (Establish Temporary Civil Administration (Friendly, Allied, and Occupied Enemy Territory)); ART 6.14.6.7 (Provide Public Safety Support).

d. Linkage to UJTL: OP 4.6.4 (Provide Law Enforcement and Prisoner Control); SN 8.1.10 (Coordinate Actions to Combat Terrorism); ST 4.4.3 (Coordinate Law Enforcement and Prisoner Control); ST 6.2.6.3 (Establish and Coordinate Protection of Theater Air, Land, and Sea LOCs); ST 6.2.6.4 (Establish and Coordinate Theater-Wide Counterintelligence Requirements); ST 8.4.1 (Advise and Support Counter-drug Operations in Theater); ST 8.4.2 (Assist in Combating Terrorism); TA 1.2.4 (Conduct Counterdrug Operations); TA 6.3 (Conduct Rear Area Security).

4-37. FOC-06-04: Employ Non-lethal Weapons and Munitions.

a. Capstone Capabilities.

(1) Non-lethal weapons are explicitly designed and primarily employed so as to temporarily incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment. Unlike conventional lethal weapons that destroy their targets through blast, penetration, and fragmentation, nonlethal weapons employ means other than gross physical destruction to prevent the target from functioning. Nonlethal weapons are intended to have one, or both, of the following characteristics:

(a) They have relatively reversible effects on personnel or material.

(b) They affect personnel and materiel differently within their area of influence.

This does not include information operations, classic electronic warfare such as radio frequency jamming, or any other military capability not designed *specifically* for the purpose of minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment, even though these capabilities may have nonlethal effects. Included within this exclusion are space-borne platforms.

(2) The Joint Mission Area Analysis for non-lethal weapons outlines required nonlethal capabilities in three core requirements: counter-personnel, counter-materiel, and counter-capabilities. Nonlethal weapons should enhance the capability of U.S. forces to accomplish the following objectives:

(a) Discourage, delay, or prevent hostile actions.

(b) Limit escalation.

(c) Take military action in situations where the use of lethal force is either not the preferred option, or is not permitted under the established Rules of Engagement.

(d) Better protect our forces.

(e) Disable equipment, facilities and personnel.

(f) Engage and control people through civil affairs operations and PSYOP.

(g) Dislodge enemy from positions without causing extensive collateral damage.

(h) Separate combatants from noncombatants.

(i) Deny Terrain.

(3) The Future Force, specifically, must be provided with organic nonlethal capabilities to disrupt, dislocate, disorganize, disintegrate, fix, isolate, suppress, and destroy enemy functions. Commanders, furthermore, must be provided with multi-functional/multi-role lethality options in integrated multipurpose system configurations. This will require the development of nonlethal weapons that are revolutionary in their capability to achieve scalable effects against targets, from mere discomfort to severe pain.

(4) The Future Force Soldier must have the ability to employ a wide array of lethal and nonlethal munitions based upon mission need, force protection, and the ROE/RUF. Nonlethal munitions may include anti-material, malodorants, electromagnetic, directed energy, thermal, marking, acoustic, incapacitating electric, kinetic, and optical. These nonlethal capabilities will be essential for improved force protection, limiting collateral damage and reducing non-combatant and friendly force casualties, especially during operations in urban and complex terrain. Commanders must also be able to execute real time battle damage assessment of the NL weapons' or systems' affect on target, especially when employing non-lethal weapons systems at standoff ranges.

b. Narrative. While the Army must remain optimized for MCO, smaller-scale contingencies will occur much more often, presenting unique challenges. Historically, smaller scale contingencies have occurred in regions with weak infrastructure, complex terrain, and diverse weather patterns. Threats typically have included mid- to low-end industrial forces, to include heavy forces equipped with early generation tanks and some mechanized, motorized, or light infantry. The typically pervasive presence of guerilla, paramilitary, and other unconventional forces further complicates operations and broadens concerns about force protection. It is this pervasive environment coupled with the presence of an actively supportive civilian populace that has caused the employment of nonlethal weapons. The MCO focus, coupled with the increasing likelihood of smaller-scale contingencies, clearly establishes the need for a full spectrum force. This force must be able to: execute the full spectrum of operations; minimize non-combatant fatalities, permanent injury, and undesired damage to property and environment; maintain force protection, reinforcing deterrence; and, expand the range of options available to commanders. All of these imperatives demonstrate a clear need for nonlethal weapons, even in conjunction with lethal weapons, to achieve a decisive outcome.

c. Linkage to AUTL: ART 1.4.1 (Provide Intel Support to Targeting); ART 2.4 (Conduct Direct Fires); ART 2.4.2 (Conduct NL Direct Fire Against a Surface Target); ART 3.0 (The Fire Support BOS); ART 3.3.2 (Conduct NL Fire Support/Offensive Info Operations); ART 5.3.1.9 (Conduct Suppression of Enemy Air Defense); ART 5.3.8.1 (Counter the Threat); ART 7.3.3.1 (Conduct BDA); ART 7.4.2.3 (Degrade Enemy Decisions); ART 8.1.2.1 (Conduct an Ambush).

d. Linkage to UJTL: SN 3.2 Manage National Strategic Firepower; SN 3.3.4 Apply National Nonlethal Capabilities; SN 3.2.6 Develop National Strategic Attack Policy; SN 3.3 Employ National Strategic Firepower; SN 3.3.2 Synchronize Strategic Attack; SN 3.3.4 Employ National Nonlethal Capabilities; SN 3.4.1 Provide Strategic Air Defense; SN 3.4.4 Safeguard National Strategic Capabilities; SN 9.1 Deter the Use of CBRNE Weapons by Threat of Force; ST 3.2.2; ST 1.6; ST 3; ST 3.1; ST 3.2; ST 3.2.2; ST 3.2.3; ST 9.2; OP 2.4.2.4 Provide Target Intel for the JOA; *OP 3 (Employ Operational Firepower); OP 3.1 (Conduct Joint Force*

Targeting); OP 3.1.6.1 (Assess Battle Damage on Operational Targets); OP 3.2.2 (Conduct Attack on Operational Targets Using NL Means); OP 3.2.2.4 (Conduct NL Attack on Personnel, Equipment & Installations Using NL Means); OP 3.2.7 (Synchronize Operational Firepower); OP 7.1 (Coordinate Counterforce Operations in the JOA); TA 3 (Employ Firepower); TA 3.2.6 (Conduct Attacks Using NL Means)

4-38. FOC-06-05: Neutralize Hazards and Restore the Environment

a. Capstone Capabilities.

(1) Neutralize Hazards and Restore the Environment includes those efforts to reduce, or eliminate, the operational impact and effects of a full range of environment-based hazards, through avoidance, mitigation, neutralization and, when necessary, restoration of the environment to acceptable safety levels (IAW Status of Forces Agreement criteria). Capabilities and enablers must exist to avoid, mitigate effects, and neutralize hazards of all types, including industrial hazards, and WME.

(2) Required capabilities include:

- Means to perform environmental risk assessment, including establishment of the environmental baseline.

- Means to conduct consequence management, when hazards cannot be avoided, or when hazards result from interception (e.g., reach back for consequence management experts).

- Be able to decontaminate vehicles on the move or at a minimum provide a deployable thorough decontamination capability far forward on the battlefield (automation).
- Be able to "see" contamination and only decontaminate those specific areas to reduce time, manpower, and logistics.
- Reduction or elimination of manpower requirements during decontamination operations. (Can be accomplished through automation/robotics and composite applications to surfaces to act as a preventive or reactive coating).
- Reduce logistics footprint of decontamination operations. (Need to continue pursuing the "silver bullet" decontaminant and at a minimum use non-aqueous decontaminants).

- Means to perform area damage control.

- Means to provide preventative medicine, and environmental surveillance.

- Disposal of unexploded ordnance unexploded ordnance (UXO).

- Visual and virtual obstacle marking system or systems.

- General engineering construction support, to restore the environment.

- Means to conduct denial operations, to eliminate potential full spectrum CBRN hazards, to include toxic industrial chemicals (TICs) and TIMs.

b. Narrative.

(1) Enemy forces are likely to have access to, and be willing to employ, WME, including the use of full spectrum CBRN weapons, as well as TICs/TIMs, and conventional mines and minefields. The enemy will use full spectrum CBRN to shape the battlefield, inflict casualties, and disrupt access to ports and airfields against targets of opportunity, or even against the threat's own people, to create the perception that American forces employed them against civilians. The U.S. Forces could become exposed to full spectrum CBRN hazards, used as a weapon of opportunity, anywhere on the battlefield, and in any phase of conflict. Exposure could occur as a result of an intentional enemy attack, through an attack on a production or storage facility, as the result of collateral damage, or through catastrophic releases of toxic or contaminated materials. Delivery means vary, and can range in technological sophistication from a bicycle, to a ballistic missile.

(2) The Future Force will be prepared to identify and deal with a wide variety of incidental and accidental hazards, and will practice sound environmental stewardship, consistent with the military situation. Neutralizing hazards, and restoring the environment, consists of many military tasks, ranging from identifying and mitigating toxic substances, pollutants, and full spectrum CBRN hazards; to military construction and repairs; clearing mines and other obstacles; decontaminating vehicles, equipment, and infrastructure; and destroying UXO. It also includes preventive medicine, environmental surveillance, and identification of chemical, biological, and nuclear agents, environmental safety precautions, and protection or elimination of potential hazard sources. Neutralizing hazards, and restoring the environment, occurs across the full spectrum of military operations, from disaster relief, to major combat operations, in any phase of an operation, in CONUS and abroad. It supports Homeland Security, force projection, assured theater access, and preserves combat power, sustaining operational and logistical distribution, and minimizing casualties, both military and civilian.

(3) The Future Force will minimize damage to soil, air, and water, in a manner consistent with the military mission. The Army's responsibility is to minimize health and occupational risks to Soldiers, while minimizing environmental impacts. Military operations are inherently harmful to the human and natural environment. The policy of the U.S. military is that incidental and collateral damage to the environment will be minimized. The United States will not deliberately, and without compelling military necessity, damage the soil, air, water, or cultural or socioeconomic entities of any nation, on any battlefield. The Army recognizes that minimizing incidental and collateral environmental damage, to the natural environment, is clearly the most responsible, cost-effective, and long-term solution for reducing risks to human health, and the natural environment. By minimizing these damaging environmental impacts, the Army reduces compliance violations, and the costs of restoration.

c. Linkage to AUTL: ART 5.1.1 (Overcome Barriers/Obstacles/Mines); ART 5.1.1.2 (Clear Obstacles); ART 5.1.1.2.1 (Conduct Area Clearance); ART 5.1.1.2.2. (Conduct Route

Clearance); ART 5.3 (Conduct Survivability Operations); ART 5.3.1 (Protect Against Enemy Hazards within the Area of Operations); ART 5.3.1.1 (Protect Individuals and Systems); ART 5.3.1.4 (Employ Protective Equipment); ART 5.3.2 (Conduct Nuclear, Biological, and Chemical (NBC) Defense); ART 5.3.2.1 (Provide NBC Protection to Friendly Forces); ART 5.3.2.1.1 (Employ Contamination Avoidance); ART 5.3.2.1.2 (Identify Nuclear, Biological, and Chemical Hazards); ART 5.3.2.1.3 (Warn Personnel/Units of Contaminated Areas); ART 5.3.2.1.4 (Report NBC Hazards Throughout the Area of Operations); ART 5.3.2.1.5 (Use Individual/Collective Nuclear, Biological, and Chemical Protective Equipment); ART 5.3.2.1.6 (Prepare for a Nuclear Strike); ART 5.3.2.2 (Decontaminate Personnel and Systems); ART 5.3.2.2.1 (Perform Immediate Decontamination); ART 5.3.2.2.2 (Perform Operational Decontamination); ART 5.3.2.2.3 (Perform Thorough Decontamination); ART 5.3.2.2.4 (Perform Area Decontamination); ART 5.3.2.2.5 (Perform Patient Decontamination); ART 5.3.4 (Provide Explosive Ordnance Disposal Support); ART 6.10 (Provide General Engineer Support); ART 6.10.1 (Restore Damaged Areas); ART 6.10.2 (Construct and Maintain Sustainment Lines of Communications); ART 6.10.3 (Provide Engineer Construction Support); ART 6.10.4 (Supply Mobile Electric Power); ART 6.10.5 (Provide Facilities Engineering Support).

   d. Linkage to UJTL: OP 1.3.1 (Overcome Operationally Significant Barriers, Obstacles, and Mines); OP 1.4 (Provide Operational Countermobility); OP 6 (Provide Operational Force Protection); OP 6.2 (Provide Protection for Operational Forces, Means, and Noncombatants); OP 6.2.8 (Establish NBC Protection in the Joint Operations Area (JOA)); OP 6.2.13 (Conduct Countermine Activities).

4-39. FOC-06-06: Understand the Battlespace Environment.

   a. Capstone Capabilities.

      (1) The Battlespace Environment includes physical, informational, and human dimensions. All of these are dynamic—they change over time, often in difficult to predict ways. Understanding the Battlespace Environment is real-time understanding of the environment (space, air, water, land, subterranean), including terrain, weather, infrastructure, hazards, populations, and their interaction, impact on operations, and options to leverage or mitigate effects, tailored to the commander's needs. The five basic functions required to fully Understand the Battlespace Environment are: Data Acquisition, Data Exploitation, Data Management, Data Representation, and Data Dissemination.

      (2) Required capabilities include:

         (a) Collection, generation and fusion of high-resolution geospatial data, and comprehensive battlespace environment information, that includes real time collection of new data, as well as supplementing existing data sets with more detail, to include civil and cultural data.

         (b) Exploitation of the full range of sensors (including humans) to gather required battlespace environment and timely fusion of this data into actionable information. For example, Civil Affairs Team, Civil Liaison Teams, and Civil Affairs Functional Experts collect civil data for project assessments.

(c) Accurate, timely, current, relevant and scalable battlespace environment data that is compatible with the network-centric environment.

(d) Common or configurable databases, interoperable with current, future joint, interagency, intergovernmental, and multinational (JIIM) systems. These same databases are used in garrison, in training and in war.

(e) Tailorable battlespace environment representation products, displayed either visually, or in some other form that is compatible with the user needs.

(f) Computer-aided analysis and reasoning tools that enable prediction and understanding, and provide accurate, timely, current and actionable advice.

(g) Efficient data management (storage, retrieval and update) resulting in the exploitation of vast amounts of battlespace environment information.

(h) Timely and assured (i.e., information assurance—both verified and validated) dissemination of battlespace environment information to all who require it.

(i) Reach to, and pull from, national and other sources, when needed.

(j) Reachback to cultural/sociological subject matter expertise specific to the culture of the battlespace environment.

(3) Joint and Coalition forces must have special purpose sensors capable of detecting and classifying full spectrum CBRN threats. These CBRN sensors must be integrated to accept data from Disparate Sensors existing for specific purposes not related to CBRN (meteorological, fire control, and others) that, when combined with CBRN sensor data, produce a synergistic data improvement.

(4) At the National, COCOM, and MACOM levels, there is a need to connect military decision makers to civilian organizations such as the Health and Human Services, World Health Organization, hospitals, and retail sales sources . This connectivity can provide seemingly disconnected indicators (rash of respiratory cases, ballooning over the shelf medication sales, industrial chemical ailments, etc) that may indicate a WME attack masked by cyclic, seasonal illnesses (flu or allergy seasons, holiday travel crowds).

(5) Civil Information Management (CIM) facilitates the Joint Commander's situational awareness, situational understanding and full-spectrum dominance. Developing the Civil Common Operating Picture helps to achieve civil information dominance to support Effects Based Operations. Civil Information Management must also support:

- Interagency (DOS, DHS, USAID, etc.).
- Coalition Partners (NATO, PFP, GWOT, etc.).

- Partner/Host Nation (PN/HN), International Organizations (UN, World Bank, IMF, OAS, etc.).
- Nongovernmental Organizations (Red Cross, World Vision, etc.).

b. Narrative.

(1) The threat will stress adaptation and flexibility. Our adversaries will understand their battlespace, and seek to deny the same understanding to us. They will seek advantages of weather, terrain, and light conditions; take sanctuary in urban and other complex terrain, and employ terrain masking; and protect high-payoff targets, by shielding these amongst noncombatants. They will leverage terrain by using natural and manmade obstacles, terrain compartments, and population centers—further complicated with mines and booby traps—to deny U.S. Forces freedom of movement. They will protect themselves from targeting, using cover and concealment, deception, obscuration, and terrain masking. They will employ special purpose forces, terror, long-range strikes, weapons of mass effects, and information capabilities. The enemy will attempt attacks on our homeland, friendly points of embarkation(POE)/points of debarkation (PODs), intermediate bases of operations, and key deployment nodes and routes. Opponents will try to counter U.S. strengths by attacking, or exploiting, our weaknesses, especially our critical dependence on C4ISR, so vital to our synergistic, system-of-systems approach. Simple and effective ISR means will allow them to leverage advanced technologies, developed by others, with a focus on their force effectiveness, rather than a competitive system overmatch with the United States. Commanders at all levels must know how the environment, across the full range of natural and man-made elements, will impact their operations, as well as the operations of the enemy, and be able to use this knowledge to gain military advantage. Future Force units will dominate land operations, providing the decisive complement to sea, air, and space operations. Soldiers and leaders, integrated through an information network, while operationally dispersed across the battlespace, will provide the joint force commander situational understanding. The ability to both predict and understand, in real time, the impact of the environment on friendly and enemy systems—including personnel, tactics, platforms, sensors and weapons—is critical. This must include the cultural aspects of this environment. Rapid access to expert knowledge will minimize the danger of cultural misunderstanding that can rapidly deteriorate into confrontation.

(2) Leaders will conduct rapid, tactical decision-making, commander action-centric operations, from physical rehearsals, to virtual, and from static CPs, to battle command on-the-move. Terrain and weather form the foundation of the COP, the summation of critical combat information within the battlespace. The ability to achieve IS, conduct precision engagement, and execute rapid, violent decisive engagements, will hinge on the quality, fidelity, and freshness of the COP. Accurate terrain and weather products, with great spatial and temporal detail, will be a necessity for supporting network sensing, mission analysis, and the military decision-making process.

(3) In order to achieve unprecedented momentum, and freedom of maneuver, the Future Force must *see* the complete picture of the operating environment, in all of its aspects. Further, the Future Force must have an *understanding* of this picture that allows it to take away the enemy's 'home court advantage,' and give our leaders a better understanding of the environment

than our adversaries. Future Force units will *see first* by detecting, identifying, and tracking the individual components of enemy units. Advanced technologies, that lead to unprecedented ISR capabilities, coupled with other ground, air, and space sensors, are networked to provide a common, integrated operational picture that will enable seeing the enemy, both in whole, and in part, as a complex, adaptive organization.

   c. Linkage to AUTL: ART 1.0 (The Intelligence Battlefield Operating System); ART 1.1 (Support to Situational Understanding); ART 1.1.1 (Perform Intelligence Preparation of the Battlefield); ART 1.1.1.1 (Define the Operational Environment); ART 1.1.1.2 (Describe the Environmental Effects on Operations); ART 1.1.1.5 (Conduct Geospatial Engineering Operations and Functions); ART 1.1.2 (Perform Situation Development); ART 1.5 (Conduct Police Intelligence Operations); ART 1.3.1 (Perform Intelligence Synchronization); ART 1.3.1.1 (Develop Information Requirements); ART 1.3.1.2 (Develop the Intelligence Synchronization Plan); ART 2.2.5 (Exploit Terrain to Expedite Tactical Movements); ART 7.0 (The Command and Control Battlefield Operating System); ART 7.2 (Manage Tactical Information); ART 7.2.1 (Collect Relevant Information); ART 7.2.2 (Process Relevant Information to Create A Common Operational Picture); ART 7.2.3 (Display a Common Operational Picture (COP) Tailored to User Needs); ART 7.2.4 (Store Relevant Information); ART 7.2.5 (Disseminate Common Operational Picture and Execution Information to High, Lower, Adjacent, Supported, and Supporting Organizations).

   d. Linkage to UJTL: OP 2 (Provide Operational Intelligence, Surveillance, and Reconnaissance); ST 2 (Conduct Theater Strategic Intelligence, Surveillance, and Reconnaissance); TA 2 (Develop Intelligence).

Section VII - Protection

> Protection is a process, a set of activities and capabilities by which the Future Force protects personnel (combatant/non-combatant), information, and physical assets against the full spectrum of threats. The Future Force will achieve this through the scaled and tailored selection and application of multi-layered, active and passive, lethal and non-lethal measures, across the Range of Military Operations, based on assessment of an acceptable level of risk. The Future Force must protect itself starting from point-of-origin, continuing through transit, employment, sustainment, and redeployment. The goal is to prevent adversaries from employing capabilities that would restrict or prevent the Future Force from conducting decisive actions at a time and place of our choosing.
>
> - Key protection activities are: detect, assess, warn, defend, recover.
> - Mission Capability Areas that focus protections efforts are:
>   - Protect Personnel.
>   - Protect Assets.
>   - Protect Information.

4-40. Joint/Army Concept Linkage. To implement future Joint Force protection, the Protection Joint Functional Concept identifies three Mission Capability Areas (MCAs): Protect Personnel, Protect Physical Assets, and Protect Information. These Mission Capability Areas, which are groupings of task-related mission capability elements, provide a synergistic effort to identify and develop protection capability enablers. In order to optimize protection, these capabilities must have the following attributes: fully integrated, networked, persistent, and effective. Their development and employment will focus on ensuring the Joint Force is provided with the maximum opportunity to conduct operations.

4-41. Desired Protection Capabilities. Protection capabilities fall into the following areas:

- Protect Personnel.
- Protect Physical Assets.
- Protect Information.

4-42. FOC-07-01: Protect Personnel

   a. Capstone Capabilities.

(1) The elements of personnel protection are: medical, anti-terrorism, personal safety, fratricide, counter-drug, non-combatant evacuation, defensive deception and psychological operations, personnel recovery, consequence management, CBRN detection, chemical, biological, radiological, nuclear and enhanced high explosive (CBRNE) protection, counterintelligence, HUMINT, explosive ordnance demolition and maritime interdiction operations.

(2) A description of the capabilities required to provide effective personnel protection is as follows:

(a) Detect. Detecting, monitoring, tracking and engaging adversary threats directed against military and civilian personnel. Surveillance, detecting and tracking must provide the necessary real-time 360 degree hemispherical data to commanders to view the overall threat to military and civilian personnel. A clear picture of the threat to personnel will allow the commander to better synchronize protection measures against specific threats in time, space and purpose. It will also allow the commander to more rapidly identify and deploy resources in a manner where they will have the most effect to protect personnel and mitigate and or neutralize enemy capabilities through the engagement of hostile capabilities. Capabilities must include the ability to sense/detect personnel-borne explosive devices, including a stand-off detection capability.

(b) Assess. The Future Force commander must continually assess an adversary's capability for or understand the dynamics of an actual attack against personnel through the collection of different types of information from different sources. The commander must arrive at an understandable construct of pending attack, or task defensive measures (both active and passive), to protect personnel to reduce casualties, and to affect recovery operations. Commanders must develop appropriate countermeasures to threats that will enhance personnel survivability and safety and repelling attacks.

(c) Warn. Timely decision to warn personnel of impending attack and decide on what individual and collective personnel protection measures to implement (active and passive personnel protection measures) to achieve the desired degree of personnel survivability to support continuity of operations. From a clear understanding of adversary actions, timely protection measures may be implemented that will deny an adversary the ability to damage, destroy, or adversely affect personnel operating in a specific area. In order to develop personnel protection decisions and actions, commanders must have a high degree of confidence that personnel protection measures they take against an anticipated or actual adversary's attack will have a high degree of success and will achieve the desired result.

(d) Defend. Based on the commander's assessment of the threat against personnel, specific active and passive personnel protection measures are executed. Personnel may be directed to don protective gear or go into hardened protective shelters. The timely and successful execution of personnel protection measures will reduce the effects of an adversary's attack, will allow the Future Force to better cope with a deteriorating situation, and will allow continuity of personnel operations and support recovery operations to return the Future Force to an operational

status as soon as possible. A coordinated effort is required to ensure the capability to continue minimum essential functions and responsibilities during a catastrophic attack.

(e) Recover. Timely recovery is essential. Capabilities that support actions taken to mitigate the attack must include the ability to employ active and passive measures aimed at decreasing the impact of adversary attacks. If effectively applied, these capabilities will facilitate quicker recovery. Recovery operations must include actions to effectively treat injured personnel, sanitize affected equipment, self-evaluation (Blue Forces), and return all to operational readiness.

(f) Understand. In the future operational environment the ability to understand what you observe is critical. Effective detection and assessment of threats are dependent upon an underlying understanding of the culture and the behaviors and conditions that are the norm for that society. Adapting perceptions to accept these norms and recognizing a deviation from these norms and responding correctly is critical to anticipating and neutralizing a threat. Improper interpretation and reaction to behavior may create a threat where none existed before.

b. Narrative. Protection of personnel is protection against the effects of adversary capabilities employed against the Joint Force's combatant and non-combatant personnel, its friends and its allies. Protection activities must be fully integrated, networked, capable of mitigating the effects of an attack, and facilitate persistence within the operational environment. The process must protect military and selected/designated civilian personnel from the effects of kinetic, non-kinetic, chemical, biological, nuclear, explosives, projectiles, and directed enemy weapons. However, vehicle active protection systems must provide protection without adding additional weight burden to the vehicle itself. Add on armor and slat armor are effective but their weight creates undo stress on suspensions and drive trains. Protection of personnel must also consider mitigating the effects of disease non-battle injury through immunizations. Force health protection represents a critical part of the full spectrum of protecting against health threats to personnel. The desired outcome of personnel protection is mission assurance and continuity of personnel operations. Personnel protection measures may be both active and passive and will include surveillance/detection, warning to don protective gear or going to collective shelters, monitoring and assessing the degree of contamination, treatment and personnel rescue after an attack. Personnel protection includes the medical capabilities of medical surveillance/ intelligence to detect, assess, warn against health threats, use of medical countermeasures to defend against threats, and medical rehabilitative care to recover following injury and illness.

c. Linkage to AUTL: ART 1.1.3 (Provide Intelligence Support to Force Protection); ART 1.3 (Conduct Intelligence, Surveillance, and Reconnaissance (ISR)); ART 2.2.11 (Conduct a Survivability Move); ART 4.0 (The Air Defense Battlefield Operating System); ART 5.3 (Conduct Survivability Operations).

d. Linkage to UJTL: ST 6 (Coordinate Theater Force Protection); OP 6 (Provide Operational Force Protection); TA 6 (Protect the Force).

4-43. FOC-07-02: Protect Physical Assets.

a. **Capstone Capabilities.** The continuous and cyclical nature of protecting critical assets is described by the interaction of the force operations activities related to sensing, understanding, deciding, and executing the tasks necessary to ensure attacks on critical assets are avoided, neutralized or mitigated. The force operations activities and how they are mapped to physical asset protection are as follows:

(a) Detect. The Future Force must be able to monitor, detect, track and engage adversary actions against critical facilities and infrastructure in sufficient time and distance to enable protection activities execution (adequately protecting these facilities and infrastructure and allowing time to assess the effectiveness of protection measures, and provide for sufficient mitigation and negation of these attacks through active and passive measures). Additionally, a system of personnel security measures to ensure the integrity of employees, contractors and others who have access to critical assets in order to prevent sabotage and espionage must be incorporated in the protection process. Sensing physical attacks such as air and missile attacks, cyber attacks and sub-surface attacks against critical facilities will require pulling together multiple sensing capabilities and information input sources.

(b) Assess. The Future Force commander must continually assess, develop and gain a clear picture of the operational environment and gain a real-time depiction of the threat against critical assets. Developing an initial understanding of the threat against critical facilities and the vulnerability of these facilities, will require the integration of sensors and information networks to provide the data necessary to create situational awareness (i.e., orient on the threat), allowing the Future Force to take timely and accurate protection measures to counter adversary actions against key facilities and to achieve the desired protection affects.

(c) Warn. This involves making timely and appropriate active and passive protection measures decisions based on the information collected from various sources. Commanders must decide to issue appropriate warnings to units and facilities and must deduce appropriate courses of action to implement appropriate critical asset protection measures in order to prevent or mitigate hostile actions against facilities. Commanders can elect to take active defense measures to interdict and neutralize an adversary's actions or, to take passive defense measures in anticipation of an adversary's attack. Once commanders reach a decision, issuing timely warnings and implementing decisions will require a C2 system that provides effective means to issue warnings and to coordinate decisions to ensure mission success and to achieve the desired protection affects.

(d) Defend. The execution of active and passive protection orders and measures is critical to achieving effective personnel protection and to defending against an adversary's attack. To accomplish the successful protection of physical assets and posture the Joint Force for timely recovery, commanders must execute a desired plan based on collaborative intelligence, to include providing direction to subordinates. Execution must be of sufficient tempo and quality to give commanders the advantage over an adversary within his force operations activity structure.

(e) Recover. Recovery spans reconstitution efforts for forces deployed, assisting in managing the consequences of an attack at an installation, or conducting military support to

designated civilian agencies. To support recovery, capabilities must be developed to reduce vulnerability and when required enable the commander to quickly restore physical assets to operational readiness.

(f) Understand. In the future operational environment the ability to understand what you observe is critical. Effective detection and assessment are dependent upon an underlying understanding of the culture and the behaviors and conditions that are the norm for that society. Adapting perceptions to accept these norms and recognizing a deviation from these norms and responding correctly is critical to anticipating and neutralizing a threat. Improper interpretation and reaction to behavior may create a threat where none existed before.

b. Narrative.

(1) The key elements of protecting physical assets are -- critical infrastructure [both military and civilian], facilities, electronic protection, physical infrastructure (both natural and build, military and civilian), major equipment (i.e., space-related facilities, air, surface, and sub-surface platforms, satellites, major bases, intermediate staging bases, etc.), rear area security, logistic lines of communications, space control, space operations, insensitive munitions/ordnance safety, mine clearing/countermeasures, anti-surface warfare and maritime intercept/interdiction operations.

(2) The desired outcome of critical asset protection is mission assurance, continuity of operations and continuity of distribution and sustainment. Protection of physical assets may include active (monitor, detect, defend, access control systems, random access measures) and passive (use of fences, alarms, reaction forces, barriers, facility hardening) defense measures.

c. Linkage to AUTL: ART 1.3 (Conduct Intelligence, Surveillance, and Reconnaissance (ISR)); ART 2.2.11 (Conduct a Survivability Move); ART 4.0 (The Air Defense Battlefield Operating System); ART 5.3 (Conduct Survivability Operations); ART 5.3.5 (Conduct Security Operations); ART 6.3.1.3 (Conduct Maneuver and Mobility Support Operations); ART 6.10.3 (Provide Engineer Construction Support); ART 6.13 (Conduct Internment and Resettlement Activities); ART 6.13.2 (Conduct Populace and Resource Control); ART 7.7.2.2 (Provide Law and Order).

d. Linkage to UJTL: OP 6 (Provide Operational Force Protection); ST 6 (Coordinate Theater Force Protection); TA 6 (Protect the Force); OP 6.5.2 (Protect and Secure Flanks, Rear Areas, and COMMZ in the Joint Operations Area (JOA)); OP 6.5.3 (Protect/Secure Operationally Critical Installations, Facilities, and Systems); OP 6.5.4 (Protect and Secure Air, Land, and Sea LOCs in the Joint Operations Area (JOA)); SN 8.1.10 (Coordinate Actions to Combat Terrorism); ST 6.2.6.3 (Establish and Coordinate Protection of Theater Air, Land, and Sea LOCs); ST 6.2.6.4 (Establish and Coordinate Theater-Wide Counterintelligence Requirements); ST 8.4.2 (Assist in Combating Terrorism); TA 6.3 (Conduct Rear Area Security).

4-44. FOC-07-03: Protect Information.

   a. Capstone Capabilities. The conduct of information protection is the interaction of the force operations activities related to sensing, understanding, deciding, and executing the tasks necessary to ensure that cyber attacks are avoided, neutralized or mitigated. The force operations activities and how they relate to computer network defense are:

   (a) Detect. The Future Force must employ an information protection Sensor Grid to monitor networks and detect potential electronic attacks against system vulnerabilities. The grid is a coordinated constellation of intrusion and anomaly detection systems (owned and implemented by various entities) deployed throughout FF information systems and computer networks. The sensors report back to Service, theater, and joint information protection service providers.

   (b) Assess. Assessing and understanding the nature of an adversary cyber attack requires the ability to quickly and accurately determine the characteristics of the attack including criticality and vulnerability of the systems against which an attack is directed, source of the attack, and purpose of the attack. By comparing the current attack's characteristics to previous attacks and coordinating with other information protection providers to learn if they are similarly affected, a commander gains understanding. A rapid assessment and employing state of the art event correlation and data reduction tools is critical to providing the commander with predictions about the attack's effects on Future Force networks and the operational impact on the commander's courses of action.

   (c) Warn. The ability to take timely and appropriate defensive action is based on the Future Force's ability to warn users quickly and to make the right decisions that enable supporting commanders to effectively counter adversary cyber attacks. Effective information protection decisions must include efficient and effective implementation of the Information Condition and the Information Assurance Vulnerability Management process for warning others of the cyber attack, determining the appropriate actions to mitigate the effects of the current attack, and selecting additional protection measures to preclude a future occurrence.

   (d) Defend. Execution of active and passive defensive response measures must be swift, focused and effective. Successful execution is predicated upon well-understood, actionable intelligence that identifies the attack's characteristics and the attacker's identity sufficient to support a wide range of information protection response operations as well as the restoration and recovery of Future Force network capabilities. Effective information protection relies heavily on automated remediation tools and can include recommendations or actions by network operations (including information assurance) restoration priorities, law enforcement, military forces and other U.S. government agencies.

   (e) Recover. The ability to effectively withstand attacks on friendly information systems is measured by system resilience and the ability to precisely detect, identify, and to disseminate precise warnings and actions taken to isolate, repel or mitigate the effects of the attacks. The recovery capabilities will include effective access denial, the ability to recover from electromagnetic attacks, ability to prevent/mitigate system intrusions, and the ability to restore corrupted data.

b. Narrative.

(1) The protection of information is any action taken to protect, monitor, analyze, detect and respond to unauthorized activity within Future Force/Department of Defense (DoD) information systems and computer networks. Protection activities must be fully integrated, networked, provide the ability for the computer network to persist within the operational environment and be effective mitigating the effects of an attack. Protecting information protection consists of both active and passive defensive measures to protect and defend systems and, when designated, non-DoD information, computers, and networks. Information protection processes employ information assurance technical solutions to the greatest extent possible. The desired outcome of protecting information is sustained computer capabilities to support the wide range of required computer operations and information assurance.

(2) Unauthorized activity may include disruption, denial, degradation, destruction, exploitation, or access to computer networks, information systems or their contents, or theft of information. Information protection measures intend to deter and defend networks from isolated threats and to detect and restore capabilities from state-sponsored threats.

(3) The key elements and strategy of protecting information is the defense-in-depth approach. Defense-in-depth constructs defenses in successive layers and positions protective technologies at the network backbone, enclave boundaries, computing environment, and supporting infrastructures. Defense-in-depth involves monitoring, analysis, and detection activities, including trend and pattern analysis. Protecting information is performed by multiple disciplines within the DoD (e.g., network operations, information protection Services, intelligence, counterintelligence, and law enforcement).

c. Linkage to AUTL: ART 5.3.8 (Conduct Tactical Counterintelligence in the Area of Operations); ART 5.3.7 (Conduct Defensive Information Operations); ART 5.3.5 (Conduct Security Operations); ART 5.3.7.3 (Conduct Tactical Information Assurance); ART 5.3.7.4 (Employ Signals Security).

d. Linkage to UJTL: OP 6 (Provide Operational Force Protection); OP 6.3.2 (Supervise Communications Security (COMSEC)); OP 6.3.3 (Employ Electronics Security in the Joint Operations Area for Operational Forces); OP 6.3.4 (Protect Information Systems in the Joint Operations Area (JOA)).

Section VIII - Strategic Responsiveness and Deployability

The Future Force must, within a joint context, be capable of rapidly deploying worldwide and arrive ready to fight or conduct other full-spectrum operations immediately upon arrival. Current strategic deployment guidelines are to be capable of deploying to a distant theater to seize the initiative within 10 days, defeat the enemy within 30 days, and be prepared for deployment to another conflict elsewhere in the world 30 days later. In order to meet the strategic responsiveness and deployability capability, the Future Force must deploy a brigade/UA on the ground in 4 to 7 days, a tactical-level UE in 10 days, three tactical-level UEs in 20 days, and five tactical-level UEs in 30 days.

Capabilities that will enable the Future Force to be strategically responsive are:
- Airlift and sealift assets and enablers.
- Theater Access Enablers.A Responsive Distribution System.Developing Installations as our Flagships.

4-45. Joint/Army Concept Linkage.

a. The US global posture of high peacetime readiness, forward deployed and forward presence forces, sea- and land-based prepositioned stocks, established access to regional bases, and standing agreements with foreign states supportive of power projection, represent permanent (or slowly changing) elements that enhance strategic responsiveness. Strategic responsiveness is a core requirement for the Future Force to provide greater options to the joint force commander for entry operations and rapid transition to decisive operations.

b. Operational maneuver from strategic distances envisions rapid movement, over global distances of highly lethal air, land, sea, and space capabilities, to converge with overwhelming power upon enemy centers of gravity, causing rapid disintegration of the enemy's land force. The goal of Future Force strategic maneuver is to move sufficient combat power from garrisons, through intermediate staging bases, directly into combat, significantly faster than today's timelines, enabling rapid, decisive maneuver. Deployment of ground forces directly into future areas denies the enemy their initial advantage, permits friendly forces to occupy or protect key terrain and facilities, and provides areas from which friendly forces can threaten enemy forces and aggression.

c. Recognizing the superior power of U.S. military forces, creative and adaptive future adversaries are expected to adopt anti-access strategies, involving several integrated lines of operation (from diplomacy to information operations to military actions), aimed at preventing or limiting U.S. involvement in regional crises. Simultaneously, they are developing focused capabilities that will permit them to physically thwart U.S. intervention through strikes against the U.S. deployment process and infrastructure, including forward operating bases, entry points, command and control nodes, and forces themselves. Anti-access capabilities readily available

through global arms proliferation and careful investment will include theater ballistic missiles, inexpensive cruise missiles, long-range rockets and artillery, weapons of mass destruction, as well as an array of unconventional, asymmetric means and information operations. Deliberate efforts to create mass casualties are additional likely components of an anti-access strategy aimed at eroding U.S. public will to remain engaged.

d. Army forces will usually deploy as part of a joint force via strategic airlift and/or sealift, integrated within a joint force deployment process. That process may also often include synchronization with or integration of multinational forces participating in U.S.-led coalition operations. Theater infrastructure may vary from developed to austere, with more and more emphasis in the recent past for the necessity to be prepared for the latter. The U.S. must further expect compressed warning time, with the adversary, as noted earlier, initially enjoying the strategic initiative and advantage of time.

4-46. Desired Strategic Responsiveness and Deployability Capabilities.

a. Capabilities envisioned to fulfill joint and Army concepts may be found in the following overarching capstones:

- Airlift and Sealift Enablers.
- Enabling Theater Access.
- Develop a distribution system that leverages the deployment network to build and sustain combat power.
- Develop Installations as Flagships for power projection, reach back and force sustainment.
- Develop and/or adapt automated tools that facilitate rapid planning and execution of the deployment of combined arms force packages in an integrated, collaborative, and combined fashion. (See Battle Command).
- Enhance deployment situational understanding of force and sustainment flow through robust C4ISR. (See Battle Command).

b. Future Forces must be capable of entry operations, including forcible entry operations. The future operational environment for deployment includes projection from our installations into underdeveloped nations, with limited ports, or nations with developed infrastructures, where threat anti-access actions have degraded or denied seaports.

c. To accomplish strategically responsive, rapid deployability, the Future Forces will require fundamental changes to our Army installations as well as strategic and operational lift capabilities, to facilitate strategic responsiveness, operational maneuver, and tactical maneuver. Additionally, the Future Force requires advanced over-the-shore capabilities, broader ability to use unimproved ports and airfields, and very rapid positioning of theater-opening enablers. These capabilities permit the joint force/UE commander to push substantial, ready-to-fight land power ashore through multiple, unimproved entry points.

d. Required capabilities to achieve strategic responsiveness, rapid deployability, and establish and maintain assured access include:

- Increased multi-modal throughput by means of multiple, parallel, simultaneous and sequential deployment to achieve deployment momentum.
- Synchronization of deployment with immediate employment of arriving forces in a Deploy=Employ paradigm, within any operational environment.
- Reduction in predictability and vulnerability to enemy counters through use of multiple improved and unimproved A/SPODs.
- Versatility and adaptability for both developed and austere theaters and to adjust deployment throughput in support of evolving campaign requirements
- Reduction in the size of the deployment infrastructure (air and sea bridge) and the time required to emplace it.
- Vertical take-off and landing (VTOL) and super short take-off and landing (SSTOL) capability to lift and move mounted and dismounted forces for tactical 3D maneuver and operational maneuver.
- Sustainment of forces via VTOL and SSTOL along discontinous air lines of communications.
- Survivability against an array of air and ground-based threats.
- Sea-based platforms for operational agility within littoral regions.
- Jointly integrated deployment C3 with en-route situational awareness.
- Advanced automated deployment planning tools.

4-47. FOC-08-01: Airlift and Sealift Assets and Enablers.

  a. Capstone Capabilities. The following required force projection capabilities encompass those capabilities most critical to achieving required improvements in lift platforms and associated technologies:

- Austere Access High Speed Sealift. Inter-theater ship that can deliver troops, equipment, and sustainment together in sufficient size and at a considerable speed to provide combat power from strategic distances to the joint force commander. With its shallow draft feature it can bypass established seaports and discharge its combat power, wherever, there is at least a 20-foot draft and an acceptable offload site. With a C4I suite on board, commanders can also conduct en route planning, receive intelligence updates, and integrate with joint forces en route.

- Intra-theater Sealift. This is the intra-theater version of strategic sealift and is the Army's future watercraft. It is another option of operational flexibility and agility that allows the joint force commander to insert combat power and sustainment with precision at countless locations along coastlines. Intra-theater sealift also expands the reach and employment options of both land-based and afloat prepositioning.

- Seabasing. Seabasing is the rapid deployment, assembly, command, projection, reconstitution, and re-employment of joint combat power from the sea, while providing continuous support, sustainment, and force protection to select expeditionary joint forces without reliance on land bases within the JOA. These capabilities extend operational maneuver options, and facilitate assured access and

entry from the sea. Army Seabasing efforts place emphasis on articulating requirements that improve force projection considering ways to overcome anti-access environments, increase deployment momentum, attain deploy = employ capabilities, enable operational maneuver from strategic distances, close the gap between early entry and campaign forces, and allow support to distributed operations.

- Joint-Logistics-Over-The-Shore (JLOTS). The Future Force will require seaport throughput enabling technologies to enhance the ability to conduct JLOTS across a spectrum of operations including offloading in deep-water seaports, degraded seaports, denied ports, small austere ports/harbors, and in-stream discharge when other options are not available to counter an enemy's anti-access strategy.

- Super Short Takeoff and Landing Airlift. This is joint airlift with the ability to carry two light/medium armored vehicles 3500 miles. It can land on 750 feet of road or field in the joint area of operations, which avoids fixed airfields and adds innumerable points of entry. Its features provide the joint commander sharply improved options to employ mounted ground forces to achieve operational surprise and conduct air-ground maneuver throughout the Joint Operational Area (JOA).

- Heavy Lift Vertical Takeoff and Landing Airlift. This is Army or joint airlift with the ability to deliver a single light/medium armored vehicle to a distance of 750-1000 miles. Generally independent of ground conditions, it enables ground force commanders to conduct initial deployments and/or forcible entry from ISBs, vertical maneuver and air sustainment in support of campaign Futures, as well as the ability to avoid predictable, linear patterns of operation.

- Rapid Expeditionary Airfield Construction. These capabilities are those that increase maximum (aircraft) on ground (MOG) capacity on austere airfields, thereby increasing inter or intra-theater air movements. The materiel solution would enable joint early entry engineers to develop additional aircraft parking and cargo storage capability. This solution should be highly deployable, easily and rapidly emplaced, and capable of supporting a loaded C-5 or C-17.

- Precision Aerial Delivery. These are capabilities in support of the joint force commander's planned scheme of maneuver when it may be necessary or desirable to conduct airdrop operations to deliver equipment into the Future Force area with payloads up to 20-ton vehicles from an offset range of 30 km. An accurate high-altitude delivery capability will significantly reduce aircraft vulnerability in non-permissive airdrop environments.

- Transportation Node Throughput Technologies. Reduce or eliminate transportation node delays through reduced materials handling equipment (MHE) requirements, advanced robotics, flexible packaging, configured loads, and improved inter-modal techniques.

   b. Narrative.

      (1) Creating and maintaining assured access to the theater in conflict is a complex endeavor involving all components of the joint force with the aim of assured capability to project and sustain power from early entry through conflict resolution. In Chapter 3, this pamphlet summarized how future adversaries of the U.S. are expected to adopt anti-access strategies to deny, delay, and/or degrade U.S. intervention in regional crises. Those strategies will have both political/diplomatic and physical components, synchronized wherever possible to strengthen their effects.

      (2) Preparations and measures needed to counter anti-access and achieve assured access will often begin well before an actual contingency occurs and then intensify as crisis breaks into conflict and U.S. intervention is undertaken.

      (3) Development of advanced air and sealift platforms will enable Future Force formations to deploy in combat-ready unit configurations (intact battalion and brigades with integrated sustainment) in a matter of days, with units prepared to begin operations shortly after arrival consistent with the Deploy=Employ paradigm. Austere access, high speed sealift; advanced logistics-over-the-shore; Army watercraft for theater support; and SSTOL or heavy lift VTOL airlift capabilities will permit the joint force/Future Force commander to push substantial, ready-to-fight land power ashore through multiple, unimproved entry points.   This approach will accelerate force flow, enhance strategic and operational agility, help deceive the enemy, and reduce his ability to deny access. The speed and versatility of these platforms will permit Army commanders to close the gap between entry forces arriving by air and immediate follow-on forces, insuring deployment momentum to expand initial entry operations and build combat power sufficiently to assume the offensive throughout the JOA.

      (4) Development of fort-to-fight or intermediate staging base (ISB)-to-fight airlifters capable of take-off and landing on unprepared runways will help reduce the number of nodes that must be transited during deployment, saving significant time, expand available entry points for both prompt and sustained power projection, and deliver Future Force formations within striking distance of Future areas.

   c. Linkage to AUTL: ART 2.1 (Perform Tactical Actions Associated with Force Projection and Deployment); ART 2.1.2 (Conduct Tactical Deployment/Redeployment Activities); ART 2.3 (Conduct Tactical Troop Movements); ART 6.3.1 (Provide Movement Control); ART 6.3.2 (Conduct Terminal Operations); ART 6.3.2.3 (Conduct Rail Transfer Operations); ART 6.3.2.4 (Conduct Marine Terminal Operations); ART 6.3.3 (Conduct Mode Operations); ART 6.3.3.1 (Move by Surface); ART 6.3.3.2 (Move by Air); ART 6.3.3.3 (Conduct Water Transport Operations); ART 6.4.3 (Conduct Aerial Delivery Support).

   d. Linkage to UJTL: SN 1 (Conduct Strategic Deployment and Redeployment); SN 3.5 (Provide Space Capabilities); SN 6 (Conduct Mobilization); ST 1 (Deploy, Concentrate, and Maneuver Theater Forces).

4-48. FOC-08-02: Enable Theater Access

a. **Capstone Capabilities.**

(1) Enabling theater access provides proactive means to ensure forces can deploy, and freely enter the theater of operations, by enhancing entry capabilities and infrastructure, mitigating adverse effects of the environment (terrain, weather, enemy action, infrastructure, industrial hazards, and local population), and protecting/facilitating multiple PODs, LOCs, and theater entry points. Once the foothold is established, the focus of Enable Theater Access changes to continuing the flow into, and out of, the theater, as well as enabling 'intratheater access' in support of operational maneuver. The continued flow of forces and the sustainment footprint, required for continued operations development of base camps and sustainment LOCs, becomes vital.

(2) Required capabilities include:

- Construction and general engineering support, including a rapidly deployable capability to expand operating capacities of Aerial Ports of Embarkation/Sea Ports of Embarkation, Intermediate Staging Bases/Forward Operating Bases, and APODs/SPODs.
- Means for identification of multiple, simultaneous, unimproved, or minimally improved, departure points and entry points.
- Standoff infrastructure assessment.
- Means to protect, preserve, enhance, and maintain deployment and employment infrastructure, to include power projection platforms.
- Means to detect and display full spectrum CBRN agents, weapons, caches, transporters, and employment means prior to entering a theater of operation.
- Enhanced over-the-shore delivery of personnel, equipment, and materiel; and controlling and managing property.
- Populace and Resource Control (PRC).
- Reachback to cultural/sociological subject matter expertise specific to the culture of the battlespace environment.

b. **Narrative.**

(1) Army forces must be ready to rapidly deploy alone via organic Army aircraft, ground vehicles, and vessels, or as part of a fully integrated JTF, in response to crisis situations, to any part of the world. Such deployments will likely be into areas with poor infrastructure, limited points of entry, and little host-nation support, and widely disparate climates, terrain, and cultures. The ability of U.S. Forces to gain and sustain access into the theater, to facilitate the appropriate flow of forces, will be vital to the success of future operations, and perhaps the center of gravity in the opening phases. Likewise, denying or impeding theater access will be a chief aim of any threat force, whether it is a state-sponsored force, or transnational actors, such as cultural or political factions. The threat's overall strategy to preclude theater access will take many forms, and likely comprise varied and simultaneous operations across the theater. The U.S. Forces can expect indirect attacks by asymmetric means, direct attacks using special purpose forces, and major terrorist attacks, potentially employing weapons of mass destruction or effects. These

attacks will be designed to deny the use of, or disable, transportation infrastructure, manipulate the population, or for attrition of U.S. combat power. The threat's effort to deny theater access will not be geographically limited to the theater of operation, but will likely extend to our homeland operating bases, and homeland infrastructure. Denying the enemy the capability to influence departure and entry points, and preventing or mitigating enemy antiaccess strategies, is key to our Future Force strategy.

(2) Maneuver Support organizations will aim to achieve 'prompt' and 'sustained' operations in enabling theater access. Enabling 'prompt' theater access focuses on those activities maneuver support organizations must accomplish, to enable deployment of a brigade/UA brigade in 4 to 7 days, and a tactical-level UE (or equivalent) in 10 days. Enabling 'sustained' theater access encompasses those activities that enable sustainment of initially deployed U.S. Forces in theater, as well as those activities that maintain the flow of combat forces to achieve deployment of 5 tactical-level UEs within 30 days. In addition to support to the Future Force, Maneuver Support organizations must be capable of providing support to Current Army organizations, allied and coalition forces, Other Governmental Organizations, such as the State Department, and NGOs, such as the American Red Cross.

(3) Cultural awareness and the ability to rapidly consult social and cultural subject matter expertise is critical to maintaining theater access. The future force must understand and address cultural matters in a manner that minimizes potential for cultural conflict. Continued access may at times be dependent upon acceptance by the resident society and culture. It is critical to understand that culture and act in a manner that minimizes the potential for conflict and increases the potential for cooperation and acceptance.

   c. Linkage to AUTL. ART 2.1 (Perform Tactical Actions Associated with Force Projection and Deployment); ART 2.1.2 (Conduct Tactical Deployment/Redeployment Activities); ART 6.10 (Provide General Engineer Support); ART 6.10.1 (Restore Damaged Areas); ART 6.10.2 (Construct and Maintain Sustainment Lines of Communications); ART 6.10.3 (Provide Engineer Construction Support); ART 6.10.4 (Supply Mobile Electric Power); ART 6.10.5 (Provide Facilities Engineering Support).

   d. Linkage to UJTL. SN 1 (Conduct Strategic Deployment and Redeployment); SN 1.1.5 (Determine Impact of Environmental Conditions on Strategic Mobility); ST 4.2.6 (Determine Theater Residual Capabilities); ST 4.4. (Develop and Maintain Sustainment Bases); TA 1 (Develop/Conduct Maneuver); TA 1.1.1 (Conduct Tactical Airlift); TA 1.1.4 (Conduct Sea and Air Deployment Operations); TA 4.4 (Conduct Joint Logistics-Over-the-Shore Operations (JLOTS)).

4-49. FOC-08-03: Distribution System.

   a. Capstone Capabilities. The following required force projection capabilities encompass those capabilities most critical to achieving required improvements distribution:

- Inter-modal Platform Technologies. Inter-modal platform and interface technologies/techniques and advanced commodity packaging and faster on/off

loading techniques for rapid deployment and distribution of forces and sustainment. Reduced number of and simplify mode transfers to increase the velocity of sustainment distribution.

- Unit Configured Load Technologies. Technologies to enhance the ability to rapidly balance unit configured loads with efficient stowage for tactical employment.

- Small Payload/High Value Delivery Technologies. Technologies that support the rapid delivery of small, high value, discrete (low tonnage, high payoff) commodities to bridge gap between traditional ground-based sustainment operations and air-based operations using rotary or fixed-wing assets.

b. Narrative.

(1) Distribution is a component of force projection, supporting the concept of operational maneuver from strategic distances and includes the use of the ISBs, contractors, and HNS; and the requirement for theater opening packages and minimize RSOI at multiple entry points.

(2) Future Force sustainment operations are based on the fundamental concept of distribution-based logistics with key underlying principles of: velocity over mass; centralized management with decentralized, multi-nodal/multi-modal execution; maximum throughput; minimum essential stock-piling; seamless two-way flow of resource; in-transit visibility of stocks; configured loads; real-time CSS situational understanding that enables anticipatory logistics; and time-definite delivery.

(3) At the operational level, distribution-based sustainment operations must be continuous, but distributed through often shifting lines of communications in order to adapt rapidly to changing conditions within the battlespace. Future Force sustainment commands must share the same quality of situational understanding as that provided to operational headquarters, ensuring that the logistics common operational picture is fully harmonized and supportive of commander priorities to optimize the efficiency of sustainment operations. Key capabilities needed are:

- Rapid BCT/UA entry into the Defense Transportation System.
- In-transit joint logistics COP.
- Intermodal, distribution-based operations for force projection and sustainment.

(4) The Future Force must have the means to protect critical deployment infrastructure from attack by weapons of mass effects/destruction. This includes the means to restore operations at a port or airfield, and along lines of communication.

(5) Improvements to the speed and effectiveness of the distribution system may be achieved by a combination of the following:

- Standardized, pre-configured, modular deployment packages, and easy force flow reconfigurability.

- Rapid force alert, assembly, and load-out.

- Forces in a ready-to-fight configuration; integrated, combined arms, unit packages.

- Faster on/off load of lift platforms.

- Simplified and common packaging and material handling, with reduced requirements for inter-nodal or inter-modal re-packaging or handling.

- Minimum intermediate staging and transshipping; movement from fort to tactical assembly area (TAA).

- Minimum reception, staging, onward movement, and integration (RSOI) on arrival.

- Integrated sustainment to enable initial self-sufficiency in short-term operations.

- Low vulnerability to flow interruption.

- Multiple departure and secure theater entry points; multiple, parallel deployment routes; offset port and airfield facilities.

- High throughput, including directly to forward operating areas.

- Distribution-based logistics in lieu of large in-theater stockpiles.

- Deployment situational understanding through automated, joint-interoperable battle command systems.

(6) The central measures of effectiveness for distribution systems are: arrival at the right place of a reasonably survivable, self–sufficient, immediately employable and effective combined arms force package appropriate to the mission and threat and sufficiently timely to arrest further deterioration of the conflict or crisis; and maintaining a rate of deployment that achieves and retains force dominance sufficient to prevent a major tactical reverse or operational pause and that directly enables campaign execution.

c. **Linkage to AUTL:** Article (ART) 2.1 (Perform Tactical Actions Associated with Force Projection and Deployment); ART 2.1.2 (Conduct Tactical Deployment/Redeployment Activities); ART 6.3.1 (Provide Movement Control); ART 6.3.2 (Conduct Terminal Operations); ART 6.3.2.3 (Conduct Rail Transfer Operations); ART 6.3.2.4 (Conduct Marine Terminal Operations); ART 6.3.3 (Conduct Mode Operations); ART 6.3.3.1 (Move by Surface); ART 6.3.3.2 (Move by Air); ART 6.3.3.3 (Conduct Water Transport Operations); ART 6.4.3 (Conduct Aerial Delivery Support).

d. Linkage **to UJTL:** Strategic Theater tasks (ST) 1 (Deploy, Concentrate, and Maneuver Theater Forces); Tactical tasks (TA).

4-50. FOC-08-04: Installations as our Flagships.

a. Capstone Capabilities. The revolutionary changes reflected by initiatives such as Army Transformation, Modular Force fielding, and Global Positioning Initiative will require fundamental changes in our installations. The role of installation is shifting to continuous support from home station to foxhole. Increased OPTEMPO, modular and agile units, the

diversity of the Army family, and increased flexibility to adapt to rapidly changing functional/operational needs supportability are placing significant demands on the capabilities and capacities of installations from a warfighter perspective. These capabilities apply to our permanent installations at home and abroad, as well as to those that support expeditionary and contingency activities. In addition or adjunct to installation natural and built infrastructure needs inculcated into the other FOCs contained herein as DOTMLPF synchronization considerations, the following encompasses those focused capabilities most critical to achieving required installation support for the Army:

- Provide Power Projection – enable the Army to rapidly respond to and sustain military actions worldwide from its installations and base camps: Provide processes, decision aids and analysis tools to assist in installation planning for effective and efficient operational support at national, regional and installation levels; enable structure installations to rapidly resize facility or infrastructure operations as required and to flexibility to adapt to evolving functional support requirements rapidly; provide analysis and planning tools to augment installation capabilities with commercial provision of goods and services; provide models and simulations to address joint mobilization, deployment and sustainment; provide systems for distributed operational support, maintenance, intelligence operations, and logistical support from multiple sites; digitize and automate installation communication systems; ensure reliable and integrated road, rail, sea and air facilities; provide for the protection critical deployment infrastructure; ensure connectivity between deployed units and home station that maintains real-time situational awareness and rapid response/reinforcement capabilities, as well as providing logistical and sustainment support; and provide decision aids and current, accurate information for garrison commanders.

- Maintain Readiness- provide Soldiers with the natural and built infrastructure to train, maintain and reconstitute: Provide the land, air, and water resources in the quantity, quality, and configuration to meet current and future training and testing requirements (See FOC-10-07: Providing Universal Training Support); provide new materials, processes and technologies for facility planning, design and construction that lower life cycle costs; provide processes, analysis tools and decision aids to detect, assess, warn, defend and recover from attack, sabotage, emergencies and natural disasters; be able to effectively set the conditions to sustain mission planning/rehearsal or deployment exercise connectivity (See FOC 07-02 – Protect Physical Assets); provide infrastructure capacities that enable embedded/distributed training across all training domains integrated through a network of interconnected installations; provide models and simulations to address joint stationing; provide technologies, analysis and risk assessment tools, and decision aids for reducing power and energy costs; provide economic and technical analysis tools to estimate factors impacting installation sustainability including impact to mission, community, and environment; provide environmentally sustainable live fire ranges and maneuver areas suitable for realistic, joint training of future forces; provide tools to manage and mitigate the environmental impact of day-to-day operations; provide automated facility systems to detect, assess, mitigate and notify of condition changes to streamline operation and maintenance; create efficiencies through well-executed customer-centered procedures and processes for continuous improvement

embracing the lean six sigma approach; provide for the analysis and exploitation of best organizational structure to maximize the effectiveness of modernized systems; and provide performance-oriented training programs to employ those capabilities in the most effective manner.

- Maintain Quality of Life – (See FOC 11-01) address the changing expectations of our more diverse and educated Army in 3 critical areas: how Soldiers and their families live; where Soldiers and their families live; and where Soldiers and civilians work. Provide tools, systems and processes that address the demands the mission places on the Soldier, their families, and our civilian workforce; be able to anticipate and provide support for, as well as mitigate the impact of, relocation of Soldiers and their families through information systems, analysis tools and decision aids; provide facilities and work places for our Soldiers, their families, and civilians comparable to that which is provided to the people they serve; provide for cost-effective, sustainable operations by reducing environmental costs of control and cleanup; achieve a balance between conserving the Army's 12 million acres of land while stabilizing fragile resources, maintaining a realistic training environment, and contributing to the quality of life for Soldiers, their families and the general public.

b. Narrative.

(1) Our installations support a joint and expeditionary force where Soldiers train, mobilize and deploy to fight and win. These forces are sustained through reach operations reducing the in theater footprint as well as providing unprecedented battle command and situational awareness at home station. Soldiers and their families who live on and off installations deserve the same quality of life as is afforded the society they are pledged to defend.

(2) The role of installations has changed significantly. No longer merely training, testing and deployment platforms and support for the well-being of Soldiers and their families, installations now provide continuous support from the foxhole to home station throughout deployment. As the Army transcends to an unprecedented level of force structure change and technology integration, installations will undergo a corresponding change in business processes, roles and responsibilities. The integrated, collective capabilities and capacities of installations in any given geographic region will far exceed what any one installation can provide. The Army is simultaneously enhancing its joint support role to interagency (domestic) and multinational (international) cooperation.

(3) Army installations are essential to maintaining the premier, expeditionary Army. The key missions for installations continues to be the provision of effective natural and built infrastructure that enable training, mobilizing and deploying the force, sustaining and reconstituting the force, and taking care of our families. What has changed is the criticality and duration of support provided to deployed forces and the level of technology integration adopted. This has led to a greater desire for multi-purpose, adaptive facilities that maximize the economical and functional benefits of standardization. Much progress has been made, but we have a long way to go to upgrade our installations to support our missions, Soldiers and their families. Adjustments to existing programs have been made and strategies continue to be

refined. Installations exist to support the warfighters and their continued well-being. The Army remains dedicated to meeting the challenge of providing quality, mission-ready installations.

    c. Linkage to AUTL: Article (ART) 2.1 (Perform Tactical Actions Associated with Force Projection and Deployment); ART 2.1.2 (Conduct Tactical Deployment/Redeployment Activities); ART 6.3.1 (Provide Movement Control); ART 6.3.2 (Conduct Terminal Operations); ART 6.4.1 (Provide Basecamp Sustainment); ART 6.10.3 (Provide Engineering Construction Support); ART 6.10.5 (Provide Facilities Engineering Support); ART 7.7.3 (Train Subordinates and Units); ART 8.3 (Conduct Stability Operations)

    d. Linkage to UJTL: Strategic National tasks (SN) 1 (Conduct Strategic Deployment and Redeployment); SN 4.1.2 (Procure, Train, Supply, Transport, and Maintain Personnel); SN 4.2 (Provide for Base Support and Services); SN 6 (Conduct Mobilization); Strategic Theater tasks (ST) 1 (Deploy, Concentrate, and Maneuver Theater Forces); ST 4 (Sustain Theater Forces); Operational (OP) OP 4.6 (Build and Maintain Sustainment Bases in the JOA; OP 5 (Provide Operational Command and Control); Tactical tasks (TA) TA 5 (Exercise Command and Control).

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Section IX - Maneuver Sustainment

Army Concepts characterize maneuver sustainment as a full-spectrum capability that is strategically responsive, deployable, agile, versatile, and survivable throughout the range of military operations and across the spectrum of conflict. Maneuver sustainment units will conduct operational maneuver from strategic distances, deploy through multiple austere points of entry, and rapidly establish maneuver sustainment operations. They will arrive in the theater of operations immediately capable of supporting simultaneous, distributed and continuous joint operations throughout the battlespace, day and night, in any terrain.

Future Force maneuver sustainment operations are characterized by simultaneous operations distributed across the battlespace in accordance with the maneuver commander's intent and operations plan. Superior situational understanding, based on advanced C4ISR capabilities and visibility of the distribution network, enables maneuver sustainment organizations to operate within the battle rhythm of maneuver commanders.

Capabilities identified as necessary to fulfill Future Force concepts include:

- Improved Sustainability.
- Global Precision Delivery enhancements.
- Power and Energy.
- Enhancements in Readiness, Reliability, Maintainability and Commonality for Sustained Operational Tempo.
- Global Force Health and Fitness.
- Global Casualty Care Management and Evacuation.
- Global Casualty Prevention.
- Improved Soldier Support.
- Global Military Religious Support.

4-51. Joint/Army Concepts Linkage.

   a. The operational capabilities outlined in the Maneuver Sustainment FOC area, when achieved in aggregate, fulfill the vision articulated in the Future Force Concepts and along with the Strategic Responsiveness and Deployability FOC area, fulfill the Army contribution to the Joint Functional Concept for Focused Logistics.

   b. The capabilities required to fulfill the Focused Logistics Joint Functional Concept include timely and precise delivery of mission-ready forces (Strategic Responsiveness and Deployability FOC), and their essential support to destinations specified by the supported joint force commander, right-sized (and potentially reduced) combat support, and combat service support footprint in the joint or combined operations area, and more cost-effective logistics support for the warfighter. Achieving the full potential of focused logistic will mean much greater certainty that future joint forces will receive the right support, at the right place, at the right time, and in the right quantities, across the full range of military operations.

c. Army Concepts characterize maneuver sustainment as a full-spectrum capability that is strategically responsive, deployable, agile, versatile, and survivable throughout the range of military operations and across the spectrum of conflict. Maneuver sustainment units will conduct operational maneuver from strategic distances, deploy through multiple austere points of entry, and rapidly establish maneuver sustainment operations. They will arrive in the theater of operations immediately capable of supporting simultaneous, distributed and continuous joint operations throughout the battlespace, day and night, in any terrain.

d. Future Force maneuver sustainment operations are characterized by simultaneous operations distributed across the battlespace in accordance with the maneuver commander's intent and operations plan. Superior situational understanding, based on advanced C4ISR capabilities and visibility of the distribution network, enables maneuver sustainment organizations to operate within the battle rhythm of maneuver commanders. Maneuver sustainment operations at the tactical level are predicated upon sustainment pulses and the cycling of units in and out of combat operations. It is from within this operational framework that mission staging, sustainment replenishment, and combat replenishment operations are conducted.

4-52. Desired Maneuver Sustainment Capabilities. Capabilities identified as necessary to fulfill the vision articulated for maneuver sustainment in the joint and Army concepts fall into the following areas:

- Sustainability.
- Global Precision Delivery.
- Power and Energy.
- Readiness, Reliability, Maintainability and Commonality for Sustained Operational Tempo.
- Global Force Health and Fitness.
- Global Casualty Care Management and Evacuation.
- Global Casualty Prevention.
- Soldier Support.
- Global Military Religious Support.

4-53. FOC-09-01: Sustainability.

a. Capstone Capabilities.

(1) Improve both strategic responsiveness and core warfighting abilities to effectively fight as an integral component of a joint, interdependent, full-spectrum, mission-tailored force, by substantially reducing overall sustainment demand (by ultimately up to 90 percent, compared to previously envisioned Force XXI/AXXI levels) while retaining an overmatching and robust operational posture. The goals and objectives of CSS will remain to provide the necessary support at the right time, in the right quantities, and at the right location.

(2) Future Force must build upon new sustainment concepts that are emerging in support of the Current Force, including:

- Split-based, modular units.
- Distribution-based sustainment—delivering the right support, to the right place, at the right time, over extended distances.
- Precision aerial delivery (to include air-land, air-drop, and sling load) for both routine and emergency resupply.
- Sustainment integrated with combat operations by the combat commander.
- Medical treatment on the move.
- Lighter weight, shelf-stable, appealing and nutritious individual and group operational rations which require little or no preparation.
- Simultaneous Deployment-Employment-Sustainment in a Joint, Interagency, Intergovernmental and Multinational (JIIM) environment.
- Reduced water consumption for CBRN decontamination.

(3) Mission Staging Operations and extended Sustainment Replenishment Operations (SRO) require that the Future Force possess enhanced abilities to provide field services (shower, field feeding, laundry, latrines, temporary shelter and mortuary affairs) along with on-site Soldier services (human resources, postal, military pay input, legal assistance and religious worship and counseling).

(4) Future Force units must be capable of executing the support missions within a JIIM environment.

(5) Future Force must be capable of executing DoD Executive Agent responsibilities as well as those missions outlined in Army Support to Other Services (ASOS) directives:

- Mortuary Affairs.
- Inland Petroleum Distribution Operations.
- Blood Supply.
- Theater Common Item and Common Service Support.
- Manager for Military Traffic Management.
- Manager for Military Postal Operations.
- Manager for Conventional Ammunitions.

(6) Future Force sustainment forces must retain the ability to support current forces.

b. Narrative. Revolutionary changes, required to support the Future Force, are among the most challenging goals of transformation, but are indeed critical to achieving the envisioned operational posture. Aggressive goals of reducing overall operational sustainment demand will not be easily achieved, but are vital to future warfighting success in the distributed battlespace. Demand for power, fuel, ammunition, repair parts, and other consumables, must be reduced or optimized across the battlespace to validate strategic responsiveness and achieve effective worldwide force projection. The Army can no longer routinely incur the expense of sustaining a largely heavy force, either at home station or deployed. Concentrated efforts must be made to develop technologies that reduce or eliminate demand. More efficient, alternative fuel propulsion systems, improved reliability, multifunctional system-of-systems components, and

lightweight, mobile, hybrid power generation must become the norm. In addition, the warfighting support apparatus must be capable of maintaining the same OPTEMPO as maneuver forces, in all weather and battlespace conditions. Sustainment must become an integral part of the maneuver commander's battle rhythm, vice an adjunct appendage. Efficiencies are also required in providing designated support to other services within the joint warfighting team, and to other lead federal agencies, when conducting interagency operations. To achieve reductions in logistics demand and footprint, mechanisms developed for the Future Force by the Army must be migrated to other supported Services and federal agencies to achieve similar reductions.

   c. Linkage to AUTL: ART 6.0 (The Combat Service Support Battlefield Operating System); ART 6.1 (Provide Supplies); ART 6.2 (Provide Maintenance); ART 6.5 (Provide Force Health Protection in a Global Environment); ART 6.6 (Provide Human Resources Support); ART 6.11 (Provide Contracting Support); ART 6.12 (Provide Distribution Management).

   d. Linkage **to UJTL:** SN 4 (Provide Sustainment); ST 4 (Sustain Theater Forces); OP 4 (Provide Operational Logistics and Personnel Support); TA 4 (Perform Logistics and Combat Service Support).

4-54. FOC-09-02: Global Precision Delivery.

   a. Capstone Capabilities. Improve both strategic responsiveness, and core warfighting abilities, to effectively fight as an integral component of a joint, interdependent, full-spectrum, mission-tailored force.

      (1) Provide real-time IM, graphically and/or digitally, of asset availability, throughout the maneuver sustainment pipeline, from point-of-origin to delivery at final destination, allowing the logistician to effectively and efficiently support the warfighter within and beyond the defined battlespace.

      (2) Deploy an operationally effective force, anywhere in the world, with reduced (RSOI) requirements. The ability to 'fight upon arrival' requires that equipment will not require reassembly of major components in order to prepare it for operations. The crew can accomplish any reconfiguration required, after unloading from the aircraft, in minutes, without the assistance of external materiel handling equipment.

      (3) Equip the Future Force with distribution enablers that allow rapid transit of multiple classes of supply over vast distances (both surface and air); equip the distribution assets with sufficient situational awareness capability as to allow "right time, right place" sustainment flow anywhere on the battlespace; standardize sustainment packaging to maximize configuration and reconfiguration of loads, limit off-system material handling equipment, and speed the movement of sustainment through the distribution system.

   b. Narrative.

      (1) The warfighter's ultimate effectiveness depends on the CSS capability to deliver (project, receive, and stage, onward move, sustain, and redeploy) the necessary forces and

materiel to a joint/multinational force, at successful corresponding mission velocity. A COP of the defined battlespace/sustainment data and an optimized seamless CSS system will allow the CSS manager to anticipate requirements, and provide focused support, when and where needed, including austere battlespace locations.

(2) Speed and precision are replacing sustainment by mass. Velocity, coupled with managed distribution and responsive transportation, is replacing stockpiles of supplies and lessening needed services. Reducing the 'logistics footprint' will give way to rightsizing the 'sustainment TEP footprint' in the Future Force. The transactions-based environment of today may be replaced by instantaneous, query-based, 'web-based' systems, enabling the force to carry fewer supplies, and streamlining overly complex and duplicative organizational structures. Supply inventory will be moving in the pipeline with definite time delivery goals. Customer wait time will be significantly reduced. Stock levels will be measured in relevant operational parameters, not hours or days of supply. Likewise, human resource support will be directed by task organizing and tailoring from the national provider level.

(3) Along with optimizing CSS information and reporting, there must be significant improvements in deployment execution systems, planning and decision support tools, asset visibility, packaging, reliability, efficiency, intermodal transfers, and inter- and intratheater lift assets. Reductions in the weight and volume of equipment and supplies, specifically fuel and ammunition, the largest commodities by volume and weight, are required for contingency and initial forces flow. Changes in force design through modularity, and split-based operations, are required to achieve this goal. Upgrading mechanisms, such as engineering change proposals, preplanned product improvement proposals, as well as block improvements and multistage improvement programs support the transition.

c. Linkage to AUTL: ART 6.0 (The Combat Service Support Battlefield Operating System); ART 6.1 (Provide Supplies); ART 6.3 (Provide Transportation Support); ART 6.12 (Provide Distribution Management).

d. Linkage to UJTL: SN 4 (Provide Sustainment); ST 4 (Sustain Theater Forces); OP 4 (Provide Operational Logistics and Personnel Support); TA 4 (Perform Logistics and Combat Service Support).

4-55. FOC-09-03: Power and Energy.

a. Capstone Capabilities. Improve both strategic responsiveness and core warfighting capabilities to effectively fight as a joint, interdependent, full spectrum, mission-tailored force. Future forces will optimize their combat effectiveness by employing advanced Tactical Electric Power (TEP) sources, fuels and energy storage. These TEP and energy storage systems will enable key operational capabilities throughout the battlespace by providing electricity to supported systems and managing power distribution across the force. TEP and energy sources are encompassed in all systems, e.g., weapons platforms (onboard and exportable power), tactical vehicles (air & ground), Soldier systems and all electrical/electronic systems. Reducing the power needs of supported systems greatly impacts the sustainment support system by producing many operationally significant benefits. For the purpose of this FOC, "operationally

"significant" is defined as any readily measurable savings that results in positive second order affects that favorably impact combatant commanders. For example, these positive affects could include the need fewer fuel tankers needed, which would support the warfight; reduced system weight and volume with a related increase in mobility or freeing-up more space on vehicles or aircraft.

b. Narrative.

(1) The means of generating, distributing and storing electrical power must exceed near-term performance and capabilities. These systems must increase performance while reducing fuel consumption, improving mobility and deployability, and increasing reliability. The capability must be readily maintainable, sufficiently durable, quiet, and survivable against all types of threats. These requirements also equally apply to energy sources and the means to store these sources, to include fuels. TEP systems and various energy sources will directly support all field electrical systems, i.e., command, control, computer, communication, intelligence, surveillance and reconnaissance (C4ISR), fire direction and controls, target acquisition, life support, sustainment, illumination, etc. All these functions are critical to efficient unit operation and mission accomplishment. TEP and energy sources provide power to enable all information dominance technologies and infrastructure.

(2) System-integrated power management technologies can potentially reduce the overall power needs of consumers. Current power and energy (P&E) consumption rates across the force significantly burden the warfighter and sustainment force. Many proposed FOC depend on significant reductions in P&E consumption. Concurrent improvements are required in TEP distribution, generation and embedded power management for all systems. This requires optimizing power source characteristics and performance, i.e., increased output with operationally significant reductions in fuel needs, weight, size and maintenance.

(3) Providing bulk fuels and packaged oils/lubricants to the Future Force remains a significant mission for the sustainment force. A single fuel forward for ground and aviation systems simplifies sustainment operations. The continued advancements in engineering, materials science and manufacturing processes results in ground systems with reduced fuel and lubrication requirements. Advanced P&E technologies could significantly reduce requirements for storing large quantities of bulk fuels for ground systems. Continued pursuit is needed for a single, common fluid to replace all system fluids, i.e., engine oil, transmission and power steering fluids and coolants. A common fluid would significantly reduce the logistics management burden of packaged POL (petroleum, oil and lubricants) products.

(4) Fossil fuels will remain the Army's major fuel source well into this century, even though these fuels may be reformed (or otherwise converted) into usable products other than jet or diesel fuels. Continued improvement in system fuel efficiency is critical to achieve a reduction in fuel support equipment and personnel. Reducing fuel consumption for highly mobile systems allows travel over greater distances in the battlespace. Reducing fuel consumption by 50 percent or greater will yield vast savings in fuel costs, resources needed to supply fuel, and provide the opportunity to use resupply methods that are not currently operationally efficient due to the volume required. Consequently, continued and accelerated

investigation is needed of P&E technologies that show the greatest potential for providing operationally significant advantages to the Future Force. These technologies must meet user needs for performance (power quality and output); system efficiency in using or converting energy sources; reliability and reductions in weight/size. The obvious operational benefits are joined by operations and support (O&S) cost savings throughout the systems life cycle. The Army must also investigate technologies that show promise in replacing fossil fuels. The selection of an alternative fuel source must consider all fuel requirements to avoid situations where we are forced to handle multiple types of fuel. The single fuel concept is critical to maintaining an agile, adaptive, efficient distribution system in the future. Again, these efforts must pursue P&E technologies that show the greatest potential for military utility. The application of these technologies must have the likelihood of significantly improving system efficiency and operational effectiveness.

(5) As Land Warrior-type Soldier systems continue to evolve, the Army will have a greater need for Soldier-carried lightweight power sources with higher specific power and/or energy values than today's power sources. The Army must continue to leverage multi-discipline technological advances that improve individual Soldier sustainment. Processes and methodologies normally used for developing weapons platforms apply to the complexities of the Soldier-system. The Army must continually seek technologies that can produce reliable and rugged miniature power sources for the Future Force's Soldier-system, i.e., cooling/heating, communications, target acquisition and individual weapon functions; sensors for surveillance and reconnaissance; assisted breathing and strength amplification. These Soldiers must have the capability to plug into a variety of sources for their P&E needs. Future Force platforms must provide an interface for Soldiers to replenish Soldier-system energy storage sub-systems.

c. Linkage to AUTL: ART 6.1.3. (Provide POL (Class III B/P); TEP systems (under the overarching P&E architecture) directly support Army Tactical Tasks (ART) under 6.10.4. "Supply Mobile Electric Power." ART 6.10.4 sub-tasks includes power production, distribution and management.

(1) In achieving this ART, TEP systems power all systems associated with every ART that require electricity. Applicable ART sub-tasks include 6.10.4.01 and 6.10.4.03. All other sub-tasks in this category are meaningless without a mobile power generation capability, i.e., 6.10.4.02. and 6.10.4.04. through 6.10.4.27.

(2) TEP systems will power systems needed to accomplish CSS BOS ARTs, i.e., (6.1.) computer systems for ordering supplies, (6.2.) equipment that provides maintenance capabilities, (6.3.) systems that support transportation management; (6.4.) sustainment support, (6.5.) medical support and (6.6. through 6.9.) personnel/financial management.

(3) Additional ARTs that TEP supports include (6.10.) general engineering support, (6.11.) contracting, (6.12.) distribution management; (6.13. & 6.14.) internment, resettlement and civil-military operations. These ARTS encompass electrical and electronic systems that need electricity from TEP systems and include sensors, communications/computer systems for data transmission, management storage & retrieval; CBRN filtration, protection & decontamination equipment; battery charging equipment, illumination, environmental control units, medical

systems, test equipment and welding equipment. This is not an all-inclusive list and does not address power requirements for all the combat and combat support C^4ISR systems that also need electricity.

d. Linkage to UJTL: SN 4 (Provide Sustainment); ST 4 (Sustain Theater Forces); OP 4 (Provide Operational Logistics and Personnel Support); TA 4 (Perform Logistics and Combat Service Support).

4-56. FOC-09-04: Readiness, Reliability, Maintainability and Commonality for Sustained Operational Tempo.

a. Capstone Capabilities. Improve both strategic responsiveness, and core warfighting abilities, e.g., to effectively fight as an integral component of a joint, interdependent, full-spectrum, mission-tailored force, through optimized application of individual component, and system-of-systems reliability, for combat and support equipment mission profiles and weapons systems. Achieving leap-ahead reliability will greatly support the Future Force's charter to decisively conduct the varied missions involved in full-spectrum operations, anywhere in the world, in any battlefield condition.

b. Narrative.

(1) Current battlefield 'down time' for maintenance renders the most lethal combat systems unacceptably exposed and vulnerable to inferior threat platforms. Commanders must have confidence that all fielded systems will perform the combat mission, without routinely experiencing maintenance problems during the execution phase. Existing vulnerabilities can be mitigated and battlefield effectiveness (e.g., mission performance) optimized, by embedding improved system-of-systems ultrareliability into the new generation of combat vehicles and weapon systems. This desired improved reliability effect consists of systems, subsystems, and components that do not fail catastrophically during the applicable mission profile. This empowering capability can be achieved through optimized application of selective mechanical, electrical and electronic redundancy, self-healing technology, and onboard diagnostic/prognostic components, leveraged from commercial technology and manufacturing processes. It can also be achieved by utilizing materials that provide quantum increases in strength, and are non-corrosive and non-erosive. The improved reliability effect is bolstered by leveraging the application of human factors technologies and practices into the analyses and execution of logistics processes, to significantly reduce manpower, operations, and training costs, while increasing responsiveness, flexibility, and agility.

(2) System Reliability. Future combat system platforms must maximize the following system (total mission package, including directed government furnished equipment (GFE)) reliability benchmarks:

- Mean Time Between System Abort (MTBSA) - failures that deadline a platform, result in unsafe operation, or make it non-mission capable.
- Mean Time Between Essential Function Failures (MTBEFF) - failure that results in system degradation.

- Mean Time Between System Abort–Mobility (MTBSA-M) - failures that affect a platform's mobility system, resulting in unsafe operation, or making it non combat capable.

The established MTBSA and MTBEFF values provide sufficient reliability to minimize critical failures during 72-hour high intensity operational periods, providing combat commanders acceptable levels of weapon systems availability during mission pulses. The platform crew chief and organic maintenance assets that are able to return ground platforms to operational condition will support inherent platform reliability. The MTBEFF reliability value enables the crew chief and maintainers to return platforms to fully mission capable status during maintenance/logistics pulses. MTBSA-M enhances force protection by maintaining integrity of combat formations, and minimizing exposure and dispersion requirements for crews and maintenance personnel. Reliability requirements ensure that a 95 percent operational availability is maintained over an operational period/pulse. SA (critical failure) events, by definition, deadline a system and require immediate (maintenance) action to return the system to an operational condition. Either the future combat system crew chief or combat repair teams (CRTs) organic to the Future Force will immediately address these failures. The stated reliability provides compliance with equipment readiness objective(s) while maximizing available combat power and minimizing sustainability demands (repair parts and maintenance resources), and at the same time accommodating Future Force structure allocations. To meet required OPTEMPOs, it is expected that Future Force combat systems will be developed using ultra-reliable and/or redundant components, and perhaps have on-board spares, in order to enable it to remain operationally effective for the full 3 to 7-day mission period. This will reduce demand, and minimize the maneuver sustainment burden on unit effectiveness, through balanced system reliability, redundancy, and repair, to include embedded diagnostics and prognostics on Soldiers and platforms, as well as modular component design. The inability to meet the stated reliability requirements will result in manpower demands exceeding those currently proposed for the Future Force design. Additionally, the inability to meet the stated MTBSA requirements may result in excessive, non deferrable maintenance and increases in manpower demands, while adversely impacting future combat system ability to meet mission pulse requirements.

(3) System Maintainability. Future combat system platforms must be designed for ease of maintainability. They should be designed for maximum modular component "plug and play" capability and integrate pit stop-like efficiencies for repairing failed systems, with an ultimate goal of rapid return to combat capability. Future combat system platforms must achieve the following minimum maintainability benchmarks:

- Maintenance Ratio will not exceed 0.05 Maintenance Man-Hours/Operating Hour (MMH/OH).

- At least 80 percent of system unscheduled field maintenance level failures must be repairable at the platform Crew Chief level. This 80 percent capability is applicable to all three types of failure (i.e., SA, EFF and NEFF).

- Mean time to repair must not exceed 0.5 hours.

- Maximum time to repair (MaxTTR) must not exceed 0.5 hours for any crew chief task.

- No special tools and minimal external test equipment required for unscheduled field maintenance tasks.

- Each future combat system must provide the capability for automated preventive maintenance checks.

- A single scheduled service requirement no more frequently than annually.

All Future Force combat systems must be supportable by the emerging Army Two Level Maintenance System (Field [on-system] Maintenance and Sustainment [off-system] Maintenance) that will be in place at the time of fielding. Two-Level Maintenance is based on a 'replace forward, repair rear' process. Only unscheduled field level maintenance will be conducted within the UA by crew chiefs and/or organic CRT. The crew chief/crew or supporting CRT replaces components and LRUs/LRMs in the UA, with on hand spares or replacements ordered through the normal supply system. Unserviceable components are evacuated to and repaired by UE units or higher echelons (military, government, or contractors) potentially as far back as CONUS. Low cost, discard-upon-failure components are preferred. As the maintenance requirements for the digitized force become clearer, and hard estimates of workload requirements are available, the sparing percentage should be reviewed in context with the overall maintenance plan. All Technical Manuals must be Class V, or higher, Interactive Electronic Technical Manuals (IETM).

(4) The Future Force Maintenance Concept will allow for significant forward deployed sustainment footprint reduction from those of current unit; but includes a high reliance on:

- Very high reliability levels.
- Modular, 'plug and play' designs that facilitate ease of maintenance at the lowest levels.
- Embedded Diagnostics and Prognostics, to include remote interrogation and triage capability.

- A 'crew chief' maintenance concept for both manned and unmanned platforms, that allows field maintenance replaceable components that are part of the crew tasks to be removed and replaced/installed by those tools on board each future combat platform.
- On-board Interactive IETMs.
- A high degree of commonality in components.

(5) Commonality. Future combat system platforms will enable significant sustainment effectiveness and efficiencies, through commonality in platforms and components, to simplify and reduce sustainment, support multifunctionality, reduce personnel and skills required, and contribute to simplification of deployment. Commonality across formations, in platforms and

components, will also contribute to simplification of maintenance and training, and reduce equipment and other resource requirements.

(6) System Readiness. The net result of reliability, maintainability, and commonality must achieve high levels of system readiness. Future combat system platforms must achieve an Operational Readiness Rate of 95 percent (Threshold) and 99 percent (Objective). System Readiness is determined as the percentage of systems and GFE available during the rating period. The operational readiness rate is a function of system reliability, and reduction of time to repair through ease of maintenance, redundancy, commonality, and modularity. The ease of maintainability of the system will allow the Future Force to achieve high readiness levels, with an austere logistics footprint, while increasing combat power by ensuring systems are operationally ready. Additionally, high Operational Readiness rates decrease the maintenance burden on mechanics and the crew chief.

   c. Linkage to AUTL: ART 6.0 (The Combat Service Support Battlefield Operating System).

   d. Linkage to UJTL: SN 4 (Provide Sustainment); ST 4 (Sustain Theater Forces); OP 4 (Provide Operational Logistics and Personnel Support); TA 4 (Perform Logistics and Combat Service Support).

4-57. FOC-09-05: Global Force Health Protection (FHP)and Fitness.

   a. Capstone Capabilities. Improve both strategic responsiveness, and core warfighting abilities, to effectively fight as an integral component of a joint, interdependent, full spectrum, mission-tailored force, by maintaining the health, medical readiness and spiritual fitness of individual Soldiers and units, under all geographic operational conditions.

   b. Narrative.

(1) Global Force Health and Fitness emphasizes physical, mental and spiritual fitness, preparedness, and preventive health measures; it is based upon the premise that a healthy and fit force is the necessary precondition for all other elements of global FHP. Because the most important weapons system in the Future Force are warfighters, their health and fitness are the basic guarantor of military success, across all spectrums of the operation. The goal is to provide optimally fit warfighters that are able to better withstand the physical, mental, and environmental stressors of any contingency deployment, across the full spectrum of operations, in support of the combatant commander. The further into a deployment, the more the opportunities and resources to enhance and maintain Soldier health and effectiveness decrease. This makes the emphasis upon preventive medical steps, employed before departure in support of a contingency deployment, more important.

(2) The modern day geostrategic environment mandates a viable force projection Army. Frequent and lengthy major deployments have become the rule. Physically fit Soldiers must be truly physiologically adaptable, and capable of serving relatively long periods of time in austere and harsh environments, with little or no prior acclimation preparation. To fulfill full-spectrum

mission requirements, Soldiers must be able to operate under a variety of different operational environments, exposing them to numerous health hazards.

(3) Deployed Soldiers must be protected against major endemic diseases, the increasing threat of occupational and environmental health (OEH) threats, and full spectrum CBRN agents. Given the intensity of future full-spectrum operations, the Soldier must be able to adapt to highly stressful operational environments, with increased mental and physical demands. This capability necessitates greater institutional emphasis on preventive medical strategies that promote overall Soldier health and wellness as the foundation of operational readiness, and precursor to contingency deployment. The proposed capability actively benefits all Soldiers in the Future Force. This capability is specifically directed at early interventions (before deployment) that maximally ensures immediate and longer-term health of each Soldier, and provides the combatant commander with the ability to withstand both physical and mental health hazards.

(4) Cutting broadly across the challenges in this FOC will be a set of products and technologies, developed or co-developed by the biotechnology and biomedical engineering communities.

(5)   Innovative low cube and reduced weight operational rations provide Soldiers essential nutrition and nourishment contributing to an increase in mental awareness and physical stamina.

c. **inkage to AUTL:** ART 6.0 (The Combat Service Support Battlefield Operating System); ART 6.1.8 (Provide Medical Material and Repair Parts (Class VIII)); ART 6.4 (Provide Sustainment Support); ART 6.5 (Provide Force Health Protection in a Global Environment).

d. **Linkage to UJTL:** SN 4 (Provide Sustainment); ST 4 (Sustain Theater Forces); OP 4 (Provide Operational Logistics and Personnel Support); TA 4 (Perform Logistics and Combat Service Support).

4-58. FOC-09-06: Global Casualty Care Management and Evacuation.

a. Capstone Capabilities. Improve both strategic responsiveness and core warfighting abilities, to effectively fight as an integral component of a joint, interdependent, full-spectrum, mission-tailored force, by improvements in combat lifesaving diagnosis, treatment, and stabilization of casualties for further evacuation to the next level of care.

b. Narrative.

(1) Global casualty care management and evacuation provides continuous essential care, to treat casualties and return them to duty, or stabilize them in theater and evacuate to the appropriate level of care. Treatment begins with the self-aid/buddy-aid which will be critical in the initial early treatment of casualties, followed by the integral adjunct of enhanced first-aid by a combat lifesaver, and trauma specialist (91W) care who provides additional medical treatment/ stabilization of casualties and coordinates evacuation, supporting basic prevention and caring, for both disease and nonbattle injury (DNBI) and combat casualties, as quickly and as close to the point of injury as possible. The trauma specialist also provides pre-hospital treatments designed

to initiate life-and limb-saving essential care, and forward resuscitative care designed to triage, resuscitate, and prepare casualties for evacuation to theater hospitals. The ability to rapidly detect, assess, and diagnose disease and illness is critical to effective and timely treatment of Soldiers exposed to a chemical, biological, or radioactive health hazard. All components are fused together by a critical-care-capable evacuation system that is able to maintain effective, continuous operations, under all battlefield conditions.

(2) The preponderance of Soldiers that die in combat does so within minutes of experiencing penetrating trauma and hemorrhage. Prompt localization, resuscitation and stabilization, followed by expedient evacuation of casualties, are essential in order to save lives. While the importance of these tenets of combat casualty care management has been demonstrated throughout the history of warfare, the nature and character of future full-spectrum operations will place even greater demands upon this aspect of warfighter support. Casualties will be more dispersed; thus the length of time required for evacuation will potentially increase. As the premier force projection Army, U.S. Forces must deploy worldwide, and conduct dominant full-spectrum operations, day and night, in all environments, without degradation of this critical element of battlefield support. Inversely, these services must be provided without disrupting operational and/or tactical momentum.

(3) Distributed operations, as envisioned in the next major theater war, will require warfighting support of all types, to be conducted increasingly forward of present day norms. Chief among these is the requirement for the Army Medical Department to effectively provide individual relief, while clearing the battlefield of all casualties, thus permitting the warfighter to continue the battle unencumbered. Responsive far-forward resuscitation, stabilization, and timely/rapid evacuation, particularly casualties with major trauma, not only affect the availability of the fighting force, but also impact the morale and readiness of the unit at large. Capabilities are required that improve diagnosis, treatment, and stabilization of casualties, for further evacuation to the next level of care, utilizing technology to enhance forward treatment to greatly improve casualty survivability. These capabilities must also significantly improve the ability of the Soldier to perform self-aid, buddy-aid, and combat lifesaver enhanced first aid, in the more dispersed and nonlinear battlespace.

(4) Future Soldiers must be trained and equipped to address the operational and tactically medical challenges associated with noncontiguous operations. While specially trained medical personnel will be present on the battlefield, the Soldier will serve as the 'First Responder', as opposed to the unit combat medic. As a 'First Responder', all Soldiers must be trained as combat lifesavers, and be capable of clearing airways, stopping bleeding, and performing cardiopulmonary resuscitation (CPR). Additionally, the Soldier must be capable of preventing shock, protecting the wound or injured area, and evacuation (under a variety of conditions and environments) for further treatment.

(5) Future Soldiers will utilize unmanned vehicles, robotics, and advanced standoff equipment to recover wounded and injured Soldiers from high-risk areas, with minimal exposure. These systems will facilitate immediate evacuation and transport, under even the harshest combat or environmental hazard conditions.

(6) Casualty collection points (CCP) will be equipped with state-of-the-art treatment equipment. The ability to provide advanced battlefield diagnosis, initial treatment, and rapidly evacuate Soldiers to/from the collection point, will greatly improve survivability. Computer-based monitoring systems will allow combat medical personnel to evaluate the patient, before reaching the rearward care facility. It will also be possible for a Soldier to be evacuated directly from the battlefield, to advanced treatment facilities outside the theater of operations.

(7) The Future Force can improve casualty survivability through responsive medical resuscitation, stabilization, and timely evacuation. Critical challenges are self-aid and buddy-aid, casualty acquisition, casualty assessment, casualty stabilization, status reporting, and evacuation. Key technologies to facilitate these capabilities include:

(a) *Physiologic sensors and databases*. Develop physiological sensors, to gather/collect data on the Soldier's health status, organized and reduced through algorithms and knowledge management, and used to generate operationally relevant performance and health status indicators, and to refine predictive models for use by commanders and medical personnel. These sensors will ultimately be integrated into a noninvasive, wear-and-forget Warfighter Physiological Status Monitor. These include multivariate databases containing:

- animal and human physiological, immunological, biochemical, and performance information;
- medium- to large-scale real-time analysis and modeling;
- miniaturization and microminiaturization of diverse sensors and effectors/actuators (mechanical and chemical);
- bioengineered materials;
- real-time medical, occupational, and environmental surveillance and monitoring; and
- high efficiency medical and personal wellness training.

Diverse hardware and software teaching systems that provide immediate, detailed feedback, plus high-speed communications and Internet connections support these databases.

(b) *Recognize casualty*. This primary requirement involves both locating the Soldiers in three-dimensional space, and determining whether they are well, injured, or dead. In addition to non-medical communication and locator technologies, this requirement involves capturing, analyzing, and interpreting signals from biological sensors on, in, or near the Soldier. This complex detection task requires most of the technologies noted in the preceding paragraph.

(c) *Assess casualty*. Although partly overlapping the casualty identification requirement, this element more specifically concerns assistance to the on-site medic, by providing significantly more detailed information on casualty status. The ability to diagnose the injury or illness as a result of a chemical, biological, and radiation exposure is paramount to effective treatment. This requires real-time detection and monitoring capabilities throughout the operational environment. Relevant technologies will include high fidelity, noninvasive imaging; employing diverse energy spectra to identify internal trauma; micro analytic techniques to assess metabolic parameters in blood and tissue; plus noninvasive instrumentation, to assess internal

pressure in the brain, chest, and abdomen. Provide triage, training and decision support tools to medical personnel that identify full spectrum CBRN agent effects and recommend appropriate treatment.

(d) *Stabilize casualty.* Although potentially addressing multiple issues, stabilizing severely injured casualties primarily concerns management of hemorrhage, replacement of fluids, replacement of blood components, and stabilization of vital functions. Needed products include:

- Naturally enhanced and synthetic materials to promote blood clotting, whether externally applied or injected into the body.
- Intelligent tourniquets to limit blood loss, without irreparable tissue damage.
- Noninvasive cauterization of small blood vessels with focally applied energy.
- Liquid compounds to restore fluid and electrolyte balance, including some that may eliminate the need to transfuse with human blood.
- Automated and semi-automated servo-controlled sensor/actuator systems for life support.
- Injectable drugs, to limit and stop secondary metabolic damage to tissue.
- Improved drugs to manage pain.
- Lyophilized and viral inactivated blood products that carry oxygen and promote clotting to injured area.
- Advanced storage systems and transportation devices to ensure temperature integrity and in-transit visibility.

Critical technologies include drug and protein analysis and synthesis, materials science, and the biomedical engineering technologies noted above.

(e) *Evacuate casualty.* The time sensitive nature of treating critically injured Soldiers requires an immediately responsive medical system that includes medical evacuation and emergency CL VIII re-supply on demand. Force Health Protection (FHP) must be immediate and continuous in nature. Patients will be evacuated immediately from the battlefield to more definitive care. Medical evacuation platforms must have the ability to provide "enroute care" through such enablers as oxygen generation systems, physiologic monitoring, networked medical information interfaces, and other life support technologies. Other key capabilities for medical evacuation include:

- Platforms capable of carrying dismounted Soldiers must have the ability to conduct casualty evacuation activities which include the ability to carry litter patients for extraction, transportation of severely injured casualties, and execution of in-stride casualty transfer to future combat medical vehicles.
- All manned future combat platforms, capable of transporting and extracting casualties, will have the ability of performing networked medical information interface support between system personnel, combat lifesavers, combat medics, unit medical elements, and higher-level medical treatment facilities.
- Future combat medical vehicle capabilities must enable the ability to treat on the move, hold, and transport casualties until evacuation or extraction.

(8) Force monitoring will aid medical personnel in providing the commander with relevant, decision-point medical information, thereby permitting timely assessments and decisions regarding Force preparedness, and employment of reserve forces.

c. Linkage to AUTL: ART 6.1.8 (Provide Medical Material and Repair Parts (Class VIII)); ART 6.5 (Provide Force Health Protection in a Global Environment); ART 6.5.4 (Provide Casualty Prevention); ART 6.5.2 (Provide Medical Evacuation); ART 6.5.3 (Provide Medical Logistics).

d. Linkage to UJTL: SN 4 (Provide Sustainment); ST 4 (Sustain Theater Forces); OP 4 (Provide Operational Logistics and Personnel Support); TA 4 (Perform Logistics and Combat Service Support).

4-59. FOC-09-07: Global Casualty Prevention.

a. Capstone Capabilities. Improve both strategic responsiveness and core warfighting abilities, to effectively fight as an integral component of a joint, interdependent, full spectrum, mission-tailored force, through the prevention of casualties. Advanced medical, occupational and environmental surveillance will allow real-time detection of chemical, biological and radiation health hazards. This will minimize health impacts by exploiting preventive measure and controls, and by providing forward interim essential diagnosis and treatment of patients prior to strategic evacuation, as well as other critical health care support services in theater.

b. Narrative.

(1) Casualty Prevention concentrates on those measures that prevent or reduce the incidence of DNBI. Casualty Prevention is the most significant medical contributions to the warfighter. Soldiers who do not become casualties remain part of the fighting force; they do not require treatment, evacuation, or hospitalization; thereby reducing the medical footprint and logistic requirements in theater. Prevention of DNBI frees medical assets to support Soldiers wounded by battle injury. Disease and nonbattle injuries remain the largest contributor to casualty production on the battlefield and include the following factors: endemic and epidemic diseases, occupational and environmental health (OEH) threats to include chemical hazards [TIM], physical hazards, industrial pollutants, as well as low-level chemical or other CBRN agents, toxic or poisonous flora and fauna, and physiological and physical stressors. The main thrust is directed at preventing casualties, reducing morbidity and mortality, and ensuring Soldier health across the full spectrum of military operations.

(2) Combat/operational stress reactions also can comprise large number of casualties in intense combat, most of whom return to duty (RTD) quickly, if treated properly and quickly in the unit area. The key to reducing combat stress is to utilize proactive and preventive techniques employed by forward positioned combat/operational stress control (COSC) personnel. The threat of chemical, biological and radiation health hazards add an extra dimension of stress. Uncontrolled stress also endangers the mission, through impaired duty performance, and by stimulating misconduct that requires disciplinary action.

(3) Because the opportunities and resources to maintain Soldier health and effectiveness nearly always decrease as deployments progress, providing efficient, effective prevention control measures, to reduce the health risk posed by medical, OEH hazards in theater, is critical. Proper health risk assessment is important to implementing any control measure, since control measures often have a direct impact on the mission. The main thrust is directed at preventing casualties, reducing morbidity and mortality, and ensuring Soldier health, while successfully completing the mission objectives. The following are key elements to preventing casualties:

(a) *Predeployment:*

- Rapid health diagnostic tests, to screen Soldiers for exiting and potential medical conditions.
- Rapidly assess and document Soldier's health status, to establish baseline prior to deployment.
- Administer vaccines and chemoprophylaxis protecting Soldiers from full spectrum of medical threat.
- Provide Personnel Protective Equipment that will significantly reduce exposure to health threat.
- Comprehensive training in protective measures to minimize health threat.

(b) *During Deployment:*

- Remote sensors will rapidly detect presence of chemical, biological, and radiation hazard at all echelons.
- Echelon I & II will have 'real time' point and standoff detection capabilities for most environmental hazards.
- Echelon III capabilities will provide 'real-time' health risk assessment and COA for unit commanders.
- Echelon IV & V will provide rapid 'reach-back' capabilities to assess health risk and countermeasures.
- All Echelons will have comprehensive systems to protect or avoid OEH hazards.
- Automated medical surveillance system will rapidly identify disease outbreak and document hazard exposure.

(c) *Redeployment:*

- Rapid diagnostic tests to screen Soldiers for potential hazard exposure or medical conditions.
- Automated medical records system to all potential health care providers documenting hazard exposure or illness.
- Chemoprophylaxis or treatment to mitigate health effects after hazard exposure.
- Automated OEHs tracking system to minimize Soldier's risk of additional exposures increasing health risk.

(d) *Post-Deployment:*

- Treatment for Soldiers who develop problems (sometimes several months/years after deployment).
- Post-deployment mental health screenings.

Significant support is required by science and technology (S&T) objectives under development to attain this capability.

(4) Cutting broadly across the many challenges will be a set of products and technologies developed or codeveloped by the engineering community. These include:

- Multivariate databases containing animal and human physiological, immunological, biochemical, and performance information;
- Medium- to large-scale real-time analysis and modeling;
- Miniaturization and microminiaturization of diverse sensors and effectors/actuators, mechanical and chemical;
- Bioengineered materials;
- High-efficiency medical and personal wellness training, supported by diverse hardware and software teaching systems that provide immediate, detailed feedback; plus high-speed communications and Internet connections.

(5) Key technologies to facilitate these capabilities include:

(a) Integration of all of the various individual Soldier medically oriented, advanced technology, and routing the data gathering, calculation, decision-making, and communication through the Soldier's individual computer, common to all 21st Century Land Warriors. Development of communications-enabled advanced technologies (both sensor and microprocessing) to support triage, diagnosis, treatment, casualty monitoring, and patient status awareness during en route care/evacuation.

- *Biomolecular threats* include the small or large molecules or complexes that enter the body and interact with cells and tissues, to cause injury or death. Primary examples are chemical and biological warfare agents, infectious diseases, and toxic environmental contaminants. The ability to rapidly detect these hazards, and implement protective measures, will significantly reduce DNBI. Critical medical products for successfully addressing these threats include vaccines and biomolecular scavengers, given pre-engagement, to enhance the body's internal defense mechanisms; and drugs to treat casualties. Barrier chemicals and repellants will be used on or near the body to deflect some kinds of agents and infections. A wide variety of individual and local area medical diagnostics will be used to rapidly recognize and identify biomolecular threats. Requisite technologies include molecular and receptor structural analysis; genetic, binding, immunological, and other assays; chemical synthesis and high throughput drug screening; pharmacokinetic modeling; genetic and protein engineering; protein synthesis; small-and large-scale drug and vaccine production; animal and human safety and

efficacy testing; molecular reference libraries; plus the analytic and communications technologies noted above. Develop diagnostic assays and reagents that will provide rapid laboratory diagnosis for broad array of biological threats and infectious diseases, using common diagnostic technologies. Identify technologies that allow for forward and confirmatory laboratory diagnosis, regardless of the etiological agent.

- *Traumatic energy threats* include the numerous, diverse ways that large amounts of energy are deposited in the body, usually in a short time span, causing small-and large-scale tissue damage leading to injury or death. Primary examples include blunt or penetrating trauma, blast, burn, heat, cold, pressure, noise, vibration, plus laser and microwave radiation. The ability to rapidly detect these hazards, and implement protective measures, will significantly reduce DNBI. Critical products for addressing these threats include extensive animal and human exposure data upon which safe equipment, training, and doctrine can be developed. Individual and local area sensors will provide both early threat alerts, and remote casualty identification. A variety of chemical and other biological products will include some that can be administered before injury, to potentially limit later damage. Required technologies include remote physiological instrumentation, generation and characterization of complex energy fields/waves, light and electron microscopic tissue pathology, biomedical risk assessment, plus most of the protein and drug analytic and development techniques mentioned above.

- *Stress threats* include those performance-degrading challenges to the 'human dimension' that affect the body diffusely, working through poorly understood mechanisms that often involve the nervous system. Operational stress reflects degraded physical and mental performance from sleep deprivation and schedule irregularity, metabolic depletion from extended and strenuous operations, boredom, fear, etc. Training and behavior stress concerns less than optimal performance, possibly reflecting the inadequacy of formal instruction, or the maladaptive elements in individual behavior. Unit, leader, and family stress concerns performance decrements related to the demands of group participation. Critical medical products for addressing these threats include recommendations for health promoting personal behavior; performance-sustaining ration supplements; injury-reducing training regimens; optimal sleep-wake schedules; performance-sustaining drugs; evolving recommendations for in-theater stress management teams; plus individual, unit, and family stress diagnostics, based partly on medical data. Beyond those noted previously, requisite technologies include behavioral epidemiology, brain and muscle metabolic imaging, individual Soldier status monitoring, plus cognitive and psychomotor performance assessment technologies.

(b) Rapidly developing biomedical technologies, teamed with parallel developments in computer, engineering, and materials sciences, will significantly transform the Army's capacity to establish and maintain Soldiers' health, as they operate in increasingly diverse and dangerous environments.

c. Linkage to AUTL: ART 6.5 (Provide Force Health Protection in a Global Environment).

d. Linkage to UJTL: SN 4 (Provide Sustainment); ST 4 (Sustain Theater Forces); OP 4 (Provide Operational Logistics and Personnel Support); TA 4 (Perform Logistics and Combat Service Support).

4-60. FOC-09-08: Soldier Support

a. Capstone Capabilities. Improve both strategic responsiveness and core warfighting abilities to effectively fight as an integral component of a joint, interdependent, full-spectrum, mission-tailored force, by enhancing the individual and collective Soldiers' operational quality of life, directly impacting their confidence, motivation, and fundamental ability to accomplish the mission. Provide responsive, quality support, in both the combat and noncombat areas of general administration (military pay, mail, legal), and other services. Examples include: personnel support and services, religious support, individual protection and survivability, Soldier sustainment, equipment endurance and functionality, and morale and welfare operations adaptable to all echelons and environments within the battlespace.

b. Narrative. Sustaining the warfighter is the paramount maneuver sustainment mission. The pursuit of mature leap-ahead technologies, advanced warfighting concepts, and increased vulnerability in the battlespace has increased overall Soldier support demands. Soldier capabilities are evolving over time, and keeping pace with the rapid advance of Soldier systems technology. Increased power density demand is the result of increased Soldier systems capabilities; from proficiency with global positioning location and tracking equipment, to an array of thermal imaging devices, laser range finders and pointers, image intensifiers, target designators, and sophisticated communications equipment. Emerging subordinate concepts responding to self-sustainment challenges in rapid deployment, early entry, minimized foot-print, asymmetric warfare, nonlinear three-dimensional battlespace, and urban and complex terrain will dictate new, more efficient strategies in power and endurance management, and production, storage, and distribution of even basic human sustainment items such as water, food, and shelter. The advancement and proliferation of threat sensors and weapons have resulted in increased vulnerability of all Soldiers, even when sheltered, resulting from thermal, radar, visual, electronic, and acoustic emissions signatures. Efficient maneuver sustainment and overall support of the warfighter are paramount maneuver sustainment missions. The application of advanced technology in power, distribution, Soldier sustainment, ammunition, and C4I—all integral subsets of Soldier support—will allow the warfighting Soldier to keep pace with emerging state-of-the-art combat systems.

c. Linkage AUTL: ART 6.4 (Provide Sustainment Support); ART 6.5.4 (Provide Casualty Prevention); ART 6.6 (Provide Human Resource Support); ART 6.7 (Provide Finance and Resource Management Services); ART 6.8 (Provide Religious Support); ART 7.7 (Support the Commander's Leadership Responsibilities for Morale, Welfare, and Discipline).

4-61. FOC-09-09: Global Military Religious Support

a. Capstone Capabilities. The Chaplaincy ensures the free exercise of religion for America's Army through a spiritually based professional Military Chaplaincy. The two core Religious Support Capabilities are professional military religious support and principal religious advisor to the command. The Unit Ministry Team (UMT) integrates these capabilities within the Military Religious Support Environment at all levels beginning with the Soldier. The UMT maintains a Religious Support Command, Coordination and Communication Center at all times within the area of operations. The functioning of these core capabilities inextricably weaves together the unique military religious support skills of the UMT.

b. Narrative.

(1) In the Future Force, Religious Support will reflect an asymmetric capability that is modular, scalable, and flexible for prompt, sustained spiritual care of Soldiers. UMTs deliver timely Religious Support to Soldiers when and where each individual Future Force Warrior needs it and in the form that supports his or her free exercise of religion requirements. The very core of the Religious Support Environment is the Soldier. Chaplaincy in the Future Force creatively integrates sophisticated technologies to enhance and extend religious support to the Soldier.

(2) The Chaplaincy will require equipment and systems that enable the UMT to perform and provide personal military religious support to the future force. It is critical that the Religious Support Team at all levels be resourced with the current and Future Force technologies to include transportation and communication equipment commensurate with the supported sections in the unit in order to have interactive, real-time data at their disposal and to provide effective and seamless Religious Support to the Future Force Warrior. The Chaplaincy will manage the Soldiers' religious support environment through professional, spiritually based, and net-centric technological systems. The UMT will require the ability to deliver requested religious support to the Soldier.

c. Linkage to AUTL: ART 6.8 (Provide Religious Support); ART 6.8.1 (Conduct Religious Services); ART 6.8.2 (Provide Religious Care and Counseling); ART 6.8.3 (Advise on Religious, Moral, and Ethical Issues); ART 6.8.4 (Conduct Religious Support Activity Training)

d. Linkage to UJTL: SN 4.3.2 (Coordinate Defense-Wide Religious Support); ST 4.2.5 (Provide Religious Ministry Support within Theater); OP 4.4.6 (Provide Religious Ministry Support in the Joint Operations Area (JOA)).

Section X - Training, Leader Development and Education

Future Force *Soldiers and leaders* must be multifunctional, and capable of fighting and winning decisively on the full-spectrum battlefields of the future as part of a joint force. Future Force training concepts will enable Soldiers and leaders to physically and mentally execute doctrine and warfighting skills to standard. Training capabilities will enable operators, maintainers, unit leaders, and staff planners to be trained in system-of-systems functions, by leveraging networked, embedded, virtual, constructive, and live training modes anywhere, anytime. Training leader development and education regimen will develop thinking, confident, versatile, adaptive, and seasoned leaders. Training focus on emerging concepts and requirements will achieve individual and collective competencies in integrated combined arms and joint tasks.

The force operating capabilities identified as necessary for training to fulfill the vision articulated in joint and Army concepts fall into the following areas:

- Leadership Training and Education.
- Accessible Training.
- Realistic Training.
- Responsive Training Development.
- Training for JIIM.
- Trainability.
- Managing Unit Performance.
- Providing Universal Training Support.

4-62. Joint/Army Concept Linkage.

a. Training is at the very core of the capabilities envisioned in all joint and Army warfighting concepts. Training determines readiness to successfully conduct military operations. Representatives of the various Services must be trained on joint operations and how to function as a member of a joint task force staff. Joint Task Force staffs must be trained on the capabilities of the different Services to effectively plan and execute joint operations.

b. Successful execution of Army concepts results from quality training and leader development. The performance of Soldiers and units in recent joint military operations can be directly linked to effective training of leaders and Soldiers, collectively and individually.

4-63. Desired Training Capabilities.

a. Army Future Force units will continue to train at home station, during operational assignments, at Combat Training Centers, and in the Army training centers and schools.

Training will still be doctrine based. The centers and schools will be the foundation of Army doctrine, initial military training, and professional military education (PME). The major difference from today will be the pervasive nature of technology that will make training more realistic, and distributive, and breakthroughs in behavioral science that will enable acceleration in the training and development of leaders and Soldiers. The accessibility of training to Soldiers anywhere, anytime will be improved through many means. For example, electronic repositories may enable rapid, on–demand doctrine access to tactics, techniques and procedures, training support packages and other training support materials. The classrooms will be both real and virtual, providing new connectivity that ports the institutional classroom to the location of Soldiers and units. Links to the Combat Training Centers will permit students to observe the lessons of the CTCs. Embedded training capabilities will provide connectivity that delivers training from the institution directly to the platform.

b. The objective of unit training in the Future Force remains combat readiness for operations across the full spectrum in joint, interagency, and multinational environments. Commanders will continue to employ proven training principles embedded in our training doctrine manuals-FM 7-0 and FM 7-1. They will base training on the principles of mission essential tasks. Unit training will be experiential and standards based, providing Soldiers and leaders relevant, realistic training environments for training across the full spectrum of operations. This training will be conducted to the same high standards at home station, at the Combat Training Centers, and during deployments. The institutions will seamlessly support units throughout this training. Meeting these requirements will require an integrated and responsive training development system, enabled by an integrated training support system which links Soldiers and units to the centers and schools and the CTCs through the Global Information Grid (GIG). Finally, new technologies will provide units with the means to manage their own training more efficiently, with fewer time consuming, overhead requirements.

c. Self- development will remain one of the pillars of training. The Soldier and leader in the Future Force will bear greater responsibility for his or her own individual development. New training strategies will include requirements for the Soldiers and leaders to maintain individual readiness. In order to accomplish this, they will be empowered with technologies that will enable them to manage their training needs.

d. Training is closely related to Human Engineering because of the shared interest in "trainability"- ensuring that human performance parameters are prime considerations in new equipment design. There is also common ground between training and battle command because of the importance of training complex cognitive skills required for battle command. In addition, training is a very horizontal component of the force operating capabilities and extends into each of the other FOCs, all of which have Soldier and leader training dimensions. The following paragraphs reflect capabilities that are required to achieve the vision for training summarized in the preceding discussion.

e. The force operating capabilities identified as necessary for training to fulfill the vision articulated in joint and Army concepts fall into the following areas:

- Leadership Training and Education.

- Accessible Training.
- Realistic Training.
- Responsive Training Development.
- Training for JIIM.
- Managing Unit Performance.
- Providing Universal Training Support.
- Cultural awareness.

Training to high standards is essential for a full spectrum force; Army forces must train to, and maintain, the highest level of readiness. Battle-focused training on combat and noncombat tasks prepares Soldiers, units, and leader to deploy, fight and win.

4-64. FOC-10-01: Leadership Training and Education

a. Capstone Capabilities.

(1) The Future Force leader development capability must produce leaders with the range of abilities and attributes needed to function effectively and independently as the battle space expands and the units they lead operate on a more sparsely populated battlefield under increasingly demanding conditions. To succeed in the Operating Environment (OE), Future Force leaders must have mature judgment, be self-aware, possess excellent interpersonal and communication skills, and above all, be adaptive and agile. They must be trained to do more and think more incisively, earlier in their careers, without increased institutional and operational training time. All pillars of the Army's FF leader training and development process must be oriented on preparing:

- Leaders who excel in the human dimension of leadership.
- Leaders who excel at critical reasoning and creative thinking.
- Leaders who possess both tactical and technical expertise across the full spectrum of operations.
- Leaders who can competently employ a wide range of new information technologies and data systems.
- Leaders who can contribute immediately upon assuming a leadership position.
- Leaders who are committed to sustaining their skills throughout their careers.
- Leaders who understand the impact of the cultural dimension on the battlespace and who excel in shaping that environment to their advantage.

b. Narrative.

(1) While leadership will remain the essential dynamic in the application of combat power, changes to the strategic environment will have major implications for the Army's leader development and training requirements. The leader development capability must provide, through training and experience, the truly effective multifaceted leaders required at all levels of the Future Force. To lead with confidence, Future Force leaders must have simultaneous strengths in several critical leadership dimensions. First and foremost, Future Force leaders must *excel in the human dimension of leadership*. Team members will be geographically distributed,

heightening the need for a shared conceptualization of the commander's intent and teamwork built on trust. Leaders must be educated to define their information requirements clearly, as well as to develop and effectively communicate their intent. They must be capable of developing mission-type orders that enable decentralized small unit initiative. They also must possess both the ability to build cohesive teams rapidly, and the essential interpersonal skills needed to communicate and work effectively with diverse groups of people, ranging from joint, coalition, and interagency personnel, U.S. and foreign civilians, to the media.

(2) Future Force leaders also must *excel at critical reasoning and creative thinking*. An escalating tempo of operations will demand higher order cognitive skills, including the rapid synthesis of information, intuitive assessments of situations, rapid conceptualization of friendly courses of action, and the ability to adjust and adapt thinking and tactical decisions, to rapidly changing situations and conditions. Operations will change from plan-centric to intent-centric; rehearsals will change from physical to virtual; and static Command Posts will give way to situational awareness on the move. Leaders must be trained to synthesize understanding of the situation from information provided by the Battle Command Construct.

(3) Future Force leaders must have the range of operational experiences, as well as the *tactical and technical expertise, to lead a force optimized for the full range of military operations*, including humanitarian assistance, peacekeeping, peace enforcement, and low or high intensity conflict, as part of a JIIM operation. Skill sets such as negotiation, cultural sensitivity, dealing with ambiguity, and conflict resolution are normal requirements in the future environments. Future Force leaders also must *competently employ a wide range of new information technologies and data systems in a networked environment*, where leaders must be prepared to operate and exploit network enabling capabilities. In addition, to effective training of digital, and network collaboration skills to support this capability, cognitive decision support, and planning aids will be required. This training will help commanders build cognitive endurance and avoid cognitive overload, ensuring the increased availability of information is efficiently processed in real-time, understood, and disseminated, to maintain dominant situational understanding.

(4) Future Force leaders at all levels must be ready to *assume leadership positions in their units, already capable of performing all of the tasks* necessary to accomplish a full spectrum of operations. This will necessitate a shortened leader training and development timeline. The training and leadership and education process must extend from the institution, to home station, to deployment, enabling Future Force leaders to gain, reinforce, advance, and accelerate the learning of essential battle command skills, when and where needed. In addition, to compressed training and leader development of tactical and technical proficiency, training systems tools, techniques, and learner centric models must prepare leaders early to master the transition from fort to foxhole and from Army to Joint operational competence. Individual and unit training and education must encompass psychological preparedness, as well as the physical and cognitive preparedness, for contingency deployments. Young leaders must be also be trained to possess the technical, tactical, and psychological training readiness for urban operations.

(5) Future Force leaders will need to play an increasingly more important role in their own development. *To sustain their skills and enhance their readiness for future operations, Future*

Force leaders must be self-aware, committed to excellence, and highly motivated to use self-development tools to enhance their readiness for future assignments.

(6) Future Force leaders must understand the impact of the cultural dimension on the battlespace. Trends of population growth, urbanization, and globalization all contribute to the likelihood that Future Force leaders will be asked to contribute to – and in many cases, lead – the resolution of the conflict that inevitably arises when different cultures interact. The skilled Future Force leader will excel in shaping the cultural environment to his advantage.

c. **Linkage to AUTL:** ART 7.7.3 (Train Subordinates and Units).

d. **Linkage to UJTL:** SN 4.1.2 (Procure, Train, Supply, Transport, and Maintain Personnel); ST 4.2.4 (Establish and Coordinate Training of Joint and Combined Forces and Conditions/Standards); SN 3.1.4 (Coordinate Joint/Multinational Training Events); SN 6.3.2 (Conduct Specified Training); SN 6.5.4 (Train Units and Individuals to Minimum Operationally Ready/POR Status); SN 7.4 (Educate and Train the Force).

4-65. FOC-10-02: Accessible Training

a. **Capstone Capabilities.** Training for the FF will capitalize on emerging technologies to make training readily accessible to Soldiers any place, any time. Dispersed Soldiers and units will be linked with one another and with the training institutions through distributed training and integrated live, virtual, and constructive (LVC) training environments. Embedding training in equipment will enable more cost effective training and mission rehearsal on-demand, whether at home station or deployed. New training technologies will be employed to provide a universal training support capability that extends to Active Army, National Guard, and Reserve units and ensures that training capabilities keep pace with advancements in warfighting technologies. Soldiers and leaders will have quick access through reach back to the training opportunities, lessons learned, and other knowledge relevant to their immediate mission or required as part of their career development plan. The accessible training capability will be characterized by:

- Effective distributed individual and collective training available globally, on- demand.
- Ability for Soldiers to train and commanders to train units without significant external support through enhanced embedded training.
- Reach back to knowledge and training repositories.

b. **Narrative.**

(1) The future training system must be as responsive as the Future Force itself, anticipating Soldier and unit training requirements to make the right training available *on-demand*. Future Force training must reflect the global nature of Army operations as part of JIIM missions and the need to deliver, on a push and pull basis, appropriate, dynamic, tactically realistic training to units during deployment, redeployment, and reconstitution, as well as to Soldiers in the institution, and at home station. Training must be distributed using a common operating environment that can be accessed by Future Force Soldiers, whenever and wherever training is needed to acquire skills, sustain combat readiness, and rehearse combat missions. Advanced

training technologies and processes must be exploited to permit the integration of individual and collective training during routine operations, and other training-hostile environments. Training strategies and tools must address geographic dispersion, both during operations, and at the home station of units.

(2) To ensure maximum flexibility in execution of training, Future Force Soldiers must have the capability to train and commanders must have the capability to train their units without significant external support. This capability will provide a means to sustain/improve unit performance with an immediate training/retraining capability anywhere, anytime. Leaders and units will rapidly resource and execute training with organic assets; saving time, and permitting focus on execution and retraining instead of time on extensive planning and coordinating unit training support, resources, and movement. Embedding training and performance support systems in the Future Forces concept, organizational, and system designs will provide much of the intrinsic, deployable capability needed. Embedded training will provide virtual and constructive multi-echelon combined arms training coverage for leaders, staffs, and units as needed to build combined arms teams and will integrate Reserve Component (RC) and JIIM capabilities. It will provide units with the capability to conduct a full range of collective training events without the physical participation of any other unit. Embedded training must meet the needs of both mounted and dismounted Soldiers.

(3) Future Force weapons platforms and equipment will have a common set of operational and user interfaces that look, feel, and function in a similar fashion, whether training or conducting combat operations. Built in capabilities will generate stimuli that simulate C4ISR feeds from notional entities, readouts and sensors indications on systems and weapon platforms, weapon effects and battle damage, and visual/aural cues. Embedded Computer Generated Forces will provide the UA, UE, JIIM/SOF, neutral and opposing forces necessary to represent the OE.

(4) Reachback to *knowledge and training repositories* will improve accessibility by reducing the turn around times for Soldiers to obtain doctrine, lessons learned, technical information, performance support, training support packages, and After Action Reports. Reach back will greatly ease training management for leaders. Future Force Soldiers and leaders must have instant access over the Global Information Grid to current information and training, resident in these repositories that can be tailored to their specific needs.

   c. **Linkage to AUTL:** ART 7.7.3 (Train Subordinates and Units).

   d. **Linkage to UJTL:** SN 4.1.2 (Procure, Train, Supply, Transport, and Maintain Personnel); ST 4.2.4 (Establish and Coordinate Training of Joint and Combined Forces and Conditions/Standards); SN 3.1.4 (Coordinate Joint/Multinational Training Events); SN 6.3.2 (Conduct Specified Training); SN 6.5.4 (Train Units and Individuals to Minimum Operationally Ready/POR Status); SN 7.4 (Educate and Train the Force).

4-66. FOC-10-03: Realistic Training

   a. **Capstone Capabilities.**

(1) Future Force training capabilities must, to the maximum extent possible, replicate the OE. This capability must include live training at home station and during deployments to CTCs and theaters. Training support capabilities must complement the fielding of current and new warfighter technologies and provide the human performance development applications that enable realistic Army and joint training and education. Further, the virtual and constructive environments must provide the realism and feel needed to train individuals, teams, and units effectively across the spectrum.

(2) The following capabilities are critical to achieve this FOC:

- Training that provides realistic replication of weapons and battlespace effects.
- Models and simulations that enable training and mission rehearsal for the full spectrum of operations in a JIIM environment.
- A synthetic training environment that accommodates training the full spectrum of operations.
- Both live and simulated training environments must be able to realistically and accurately portray the societal and cultural aspects of the future operational environment.

b. Narrative.

(1) Live training will remain a cornerstone requirement for Future Force Soldiers and units, but constrained resources and training environments will continue to limit live training. *Future Force training must provide realistic, real time replication of weapons and battlespace effects,* embedded into all training environments with commonality at the institution, home station, and deployed (operational theater) and combat training center (CTC). In addition to the replication of weapons employment and effects, to be realistic, Future Force training must also replicate employment of C4 capabilities, employment of ISR resources/ information, survivability capabilities, sustainment capabilities, and replication of the effects of the environment on the battlefield. Training Support must universally enable realistic training in the operational arts of war constructs of: Move, Shoot, Communicate, See the Battlefield, Survive, and Sustain, all within a JIIM environment. Portrayal of that environment must include an accurate representation of the social and cultural aspects to be encountered.

(2) Future Force training requires *models and simulations that enable training and mission rehearsal for the full spectrum of operations within a networked JIIM environment.* Models and simulations must be flexible and adaptable, replicating the OE, emerging weapons systems, human factors, and robot behaviors. These models must be available in a continuous, persistent environment to meet training demands from distributed locations worldwide. The successful execution of training for the Future Force will also require the capability to link live, virtual, and constructive simulations seamlessly, to present the best environment for training individuals, leaders, staffs, and units on the right tasks, at the right place and time. To create this interactive 'synthetic training environment', all simulation systems, instrumentation systems, C4I, and weapons systems must operate and interoperate, using common databases that accurately represent human and group behaviors, atmospheric and ground effects, and include virtual terrain that replicates the actual theater of operation. *This synthetic training environment must be able*

to accommodate the full spectrum of operations within the JIIM environment, from special operations to logistics to combat, and be sufficiently interactive to allow combined training of the different elements. This capability must also provide commanders the tools to select or modify the range of available operational environments, for precisely training their Soldiers, staffs, and units on specific shortcomings, or tasks relevant to an upcoming mission.

4-67. FOC-10-04: Responsive Training Development

   a. Capstone Capabilities. The end state training development system must have the capability to support shorter cycle times by rapidly capturing and integrating garnered insights and changes, leading to timely and effective training products needed for both individual and collective training for Future Force jobs. A responsive training development system must be capable of:

- Producing Soldiers who can perform a wide range of tasks.
- Conducting comprehensive analysis of Future Force functions, jobs, skills, and knowledge requirements.
- Using skill decay models and decision tools that enable trainers to determine how, when, and where to deliver training and performance support most effectively and efficiently.
- Enabling trainers and training developers to work collaboratively in a distributed environment to rapidly develop training tailored to individual or unit needs.
- Ensuring, through quality assurance and other feedback mechanisms, that training planning and development address the most critical FF training requirements.
- Rapidly document training resource requirements and provide for accelerated delivery of these resources.

   b. Narrative

   (1) Many Future Force jobs and tasks will be complex and/or difficult to train, thus creating a significant technical and intellectual challenge to the training development system. *Comprehensive analysis of Future Force functions, jobs, tasks, skill, and knowledge requirements* will be a crucial early phase of training development for the Future Force. Requirements such as language and cultural awareness create new and challenging conditions for training. As many of the Future Force Soldier skill sets are not yet well defined, it will be important to maintain an ongoing program of comprehensive analyses of Future Force functions, jobs, tasks, skills, and knowledge requirements to fuel the training and leader development process for unit and individual training. The Future Force will incorporate sophisticated technologies such as robotic vehicles, advanced sensors, and information technologies into the Future Force equipment systems. Changes in force designs and missions executed in a JIIM environment, will introduce more collective/team tasks, and increase task performance requirements. Similarly, the multi-skilled Soldier, a cornerstone human dimension concept for the Future Force Soldier, will introduce a training development challenge. Future Force Soldiers will need to be 'multi-skilled', meaning Soldiers *capable of performing a wide range of tasks*. The concept directly supports Future Force operational requirements by broadening individual skills for greater depth and redundancy within a unit. This allows smaller footprints without loss

of capability and drives the training system to prepare Soldiers to be more adaptable and skilled relative to mission performance. The training developed for multiskilled Soldiers must be based on a complete understanding of skills sets needed and their interplay with the OE.

(2) Responsiveness must characterize Future Force training development, as well as training execution. *Skill decay models and decision tools that enable trainers to determine when, where, and how to deliver training and performance support most effectively and efficiently are essential capabilities.* The training system must also provide training developers the tools and decision support systems needed to analyze, design, develop, and execute training efficiently and effectively. Low cost, personal computer based tools that facilitate shorter training development lines will be critical.

(3) Future Force training must be sufficiently responsive and robust, to ensure that units accommodate rapid changes in doctrine, organization, and equipment, while maintaining readiness and meeting current operational requirements. *This will necessitate links between units, schools, and training centers, to enable collaborative training development, delivery, testing, and evaluation in a distributed mode, as well as rapid feedback on training requirements.* All Army trainers, regardless of component or location, must have the capability to prepare, produce, and rapidly reconfigure individual Soldier and unit performance-oriented, standards-based, and realistic multi-echelon training. *Quality assurance mechanisms and other feedback capabilities will be critical to ensure that training planning and development addresses the most critical Future Force training requirements.* All aspects of the training system must be 'user friendly.' To achieve this end, a formal and accountable 'Usability Engineering' process must be incorporated into the developmental process for training products and systems.

4-68. FOC-10-05: Training for Joint, Interagency, Intergovernmental and Multinational (JIIM) Operations.

a. Capstone Capabilities.

(1) The Future Force will train and operate in a joint environment that will frequently include interagency and multinational organizations. During JIIM operations, commanders and Soldiers will be interdependent with personnel from other services, coalition forces, governmental and non-governmental organizations and they must be prepared to operate effectively in that environment in spite of language and cultural differences, communication difficulties and disparities in technologies. The conditions will be set in our training culture for Soldiers to succeed in JIIM Operations. Soldiers from top to bottom will be trained and comfortable working in JIIM environments. The Future Force training system must have:

- Capability to train JIIM operations, including capabilities that facilitate the training of forces with incompatible coalition C4I systems.
- Joint and multinational doctrine, training and knowledge programs.

b. Narrative.

(1) Future Force operations will routinely have significant JIIM aspects, making effective, well-integrated training vital to ensure the readiness of the entire team to respond to crisis, and conduct operations throughout the full spectrum of operations. The training system must provide commanders the capability to conduct training or mission rehearsals simultaneously, at widespread geographic locations, using different simulation systems, in a mix of live, virtual, and constructive environments, on an interactive basis, in preparation for single service or JIIM operations. Training simulations and capabilities that link to other services for geographically dispersed training will be essential to develop and sustain JTF HQ training readiness as well as JTF augmentation elements. These same capabilities must be utilized to facilitate the routine integration of the RC into live, virtual, and constructive exercises, thereby enhancing readiness. In addition, Future Force leaders must have training aids and other technologies necessary to facilitate the integration and training of dissimilar forces, particularly with respect to *different levels of C4 capabilities that complicate information interoperability with coalition forces*. CTCs will train Army units in a JIIM/SOF environment so that leaders are trained in the complexities of future battlefields.

(2) Army JIIM doctrine and training programs must produce strategically responsive, rapidly deployable TSPs and other training and training support products designed for training in a JIIM environments and/or for training within a JIIM context. There will be an increased emphasis on adapting JIIM training with lessons learned from JIIM operations, as well as incorporating scenarios, case studies and other instructional approaches with JIIM operations as the context. Soldiers will be trained to understand and appreciate the cultures of other nations, other services and other governmental agencies and non-governmental organizations. Tasks and conditions will be identified, and training and feedback strategies will be developed to make JTF and tactical interactions effective. There will be an increased emphasis paid to training of skills needed for collaborative planning and decision-making in a JIIM context. Given the requirement for Future Force division/ corps to function as Army Forces (ARFOR) Commands, Joint Force Land Component Commands, and JTF HQ capabilities are required to be embedded at the appropriate level of PME curriculum for the preparation and training of future JTF commanders and staff elements, beyond the inherent Army-based leadership and education curriculum. Leader development standards define what is required of JTF commanders and staffs.

   c. **Linkage to AUTL:** ART 7.7.3 (Train Subordinates and Units).

   d. **Linkage to UJTL:** SN 4.1.2 (Procure, Train, Supply, Transport, and Maintain Personnel); ST 4.2.4 (Establish and Coordinate Training of Joint and Combined Forces and Conditions/Standards); SN 3.1.4 (Coordinate Joint/Multinational Training Events); SN 6.3.2 (Conduct Specified Training); SN 6.5.4 (Train Units and Individuals to Minimum Operationally Ready/POR Status); SN 7.4 (Educate and Train the Force).

4-69. FOC-10-06: Managing Unit Performance.

   a. **Capstone Capabilities.** Future Force commanders must have the ability to tailor designated units, and the training/performance support strategies for those units, to the tasks and unique conditions of the immediate mission. This capability must enable commanders to select Soldiers for units, task forces, special team assignments, and duty assignments, based on

Soldiers' skills and proficiency on mission-relevant tasks. Capability must contribute to commander's assessment of unit readiness for current or predicted mission contingencies. Key capabilities are:

- Future Force commanders can quickly provide the training and performance support needed by their Soldiers to reach the required level of readiness.
- Training management strategies optimize the time war fighters spend in training vice preparing for training or carrying out training related administrative duties.

b. Narrative.

(1) Future Force commanders *must have the capability to quickly provide the training and performance support needed by their Soldiers to reach the required level of readiness.* They must be able to identify Soldier and unit capabilities required to accomplish a mission. They must also rapidly create the optimal tailored team or unit; diagnose performance shortfalls; and develop near, short and long-range individual and collective training plans. Commanders must have persistent availability to training and performance support tools.

(2) Once performance deficiencies have been identified, commanders will require automated tools to support rapid teaming and mission preparation programs to insure that mission-tailored units achieve the level of readiness needed for rapid deployment. Commanders will also need capabilities to do collaborative training of those active component and RC Soldiers and units considered most likely to deploy together, based on contingency planning.

(3) *Training management strategies must optimize the time war fighters spend participating in training, vice preparing for training or conducting administrative duties*, and must support institution, unit, and deployed (operational theater and CTC) training. A training management system must assess, document, and report individual and collective training status and requirements, providing feedback on training needs and assisting trainers, Soldiers, and leaders in identifying training events and resources required to carry out training plans.

c. **Linkage to AUTL:** ART 7.7.3 (Train Subordinates and Units).

d. Linkage to UJTL: SN 4.1.2 (Procure, Train, Supply, Transport, and Maintain Personnel); ST 4.2.4 (Establish and Coordinate Training of Joint and Combined Forces and Conditions/Standards); SN 3.1.4 (Coordinate Joint/Multinational Training Events); SN 6.3.2 (Conduct Specified Training); SN 6.5.4 (Train Units and Individuals to Minimum Operationally Ready/POR Status); SN 7.4 (Educate and Train the Force).

4-70. FOC-10-07: Providing Universal Training Support

a. Capstone Capabilities. The universal aspect of training support will provide access, at all Army installations and during deployments, to whatever training capabilities are needed to support training of units, whether those units are equipped fully with digitized battlefield capabilities, or not. The capability will provide training support products and services for exercises, battle drills, and mission rehearsal capabilities with worldwide, around-the-clock

availability to Soldiers, leaders, and trainers. Capability will support the provision of realistic, mission-focused, individual, unit, and leader training support, using state-of-the-art performance enhancement technologies that prepare the Army to succeed across a wide range of military operations in JIIM environments. Capability will allow the Army to synchronize training operational capabilities with warfighting capabilities and provide operationally relevant training opportunities that directly support the Army mission. Key capabilities are embodied in the following characteristics:

- Universal accessibility to training support products and services.
- Operational characteristics that support training to Move, Shoot, Communicate, See the Battlefield, Survive, and Sustain.
- Responsive, timely delivery/fielding of training enablers to units and the institution; a holistic plan that provides for equipment, facilities, maintenance, and operators throughout the lifecycle of the enabler.

   b. **Narrative.**

      (1) The key *universal accessibility* characteristic extends *training products and service*s to Active Army, National Guard, and Reserve units and matches advanced warfighting technologies used in units to their training capabilities. The universal training support capability will provide the human performance development applications that enable Army training and supporting education. Accessibility to advanced training services and technologies will add improved functionality and flexibility especially in a military training setting where time and relevance are critical. Key elements of the universal training support capability will be:

         (a) Architectures/Standards – a universal approach for the structure, the relationships, standards, and protocols used to build training support hardware, software, and materiel.

         (b) Training Information Infrastructure - a standards-based information exchange backbone capability that connects training and operational infrastructures.

         (c) Training Aids, Devices, Simulations, and Simulators – the capability to reach out and use training instrumentation, engagement simulation, wargames and simulator systems, targetry, ammunition, and OPFOR systems and simulators.

         (d) Training Products - a universal method of assuring of compliance with and development of regulatory, administrative, guidance, doctrinal, technical, documents, and training materials and tools.

         (e) Training Facilities/Land - provide coordinated access to and allocation of real estate assets, classrooms, battle simulations centers, distance learning facilities, buildings, training ranges, impact areas, logistic support areas, and maneuver areas that provide the venues in which training occurs. This includes availability of optimization methods to mitigate environmental conflicts and constraints while supporting the ability to train to proficiency. The Future Force requires state-of-the-art training lands and ranges. Increased environmental scrutiny and land-use pressures threaten the Army's ability to support these training requirements. Threatened and

endangered species present on training lands causes a significant impact on current and future mission and training activities. Methods to assess the impact of military training activities on threatened and endangered species to include disturbance from maneuver and other training, smokes and obscurants, noise, military-generated toxics, habitat encroachment and fragmentation, must be developed. Minimizing environmental conflicts and constraints, while supporting the ability to train to proficiency, requires that Army lands, including active live-fire and test ranges, inactive ranges, and other Army lands, must be restored and sustained. Optimal beneficial use of Army lands requires integrated planning, design, management, and maintenance procedures that incorporate explosive safety, environmental compliance and restoration, and natural resources management.

(f) Training Services - provide access to essential ancillary capabilities, including instructional/doctrinal/logistical support, courseware management/development, devices management, training literature and information management, video information services, requirements/ acquisition management, and resource management.

(g) Training Management, Evaluation, and Resource Tools – the capability to reach out and use tools to schedule/manage events, monitor/assess training performance, and manage training support/resources/requirements. Evaluations must be performance-based, not memorization-based.

(2) Key *operational characteristics of the universal training support system will correspond to the operational art of war constructs* of: Move, Shoot, Communicate, See the Battlefield, Survive, and Sustain. Just as these operational constructs must work together on the battlefield, essential training support characteristics must work together within the institutional, operational, and self-development domains to support individual, collective, and Joint training. Characteristics of the training support capability for each of the operational constructs include:

(a) Move – The characteristic ability to train warfighters to deploy and maneuver over vast open or complex and urban terrain.

(b) Shoot - The characteristic ability to train warfighters to employ firepower in complex operational circumstances.

(c) Communicate - The characteristic ability to train warfighters to command and control, make decisions and collaborate over unprecedented distances.

(d) See the battlefield - The characteristic ability to train warfighters to use sensors and their senses to understand what's happening.

(e) Survive - The characteristic ability to train warfighters to use protective measures and countermeasures to avoid casualties.

(f) Sustain - The characteristic ability to train warfighters to resupply, transport logistics supplies, conduct medical operations, and perform support engineering tasks.

c. Linkage to AUTL: ART 1.1: Support to Situational Understanding; ART 2.2: Conduct Tactical Maneuver; ART 3.1: Decide Surface Targets to Attack ART 4.1: Prepare to Defend Against Air Attack and Aerial Surveillance; ART 5.1: Conduct Mobility Operations; ART 6.1: Provide Supplies; ART 7.1: Establish Command Post Operations.

d. **Linkage to UJTL:** SN 1.2 Conduct Deployment and Redeployment; SN 3.1 Coordinate Forward Presence of Forces in Theaters; SN 3.4.2 Provide Integrated Tactical Warning and Attack Assessment; SN 6.5.4 Train Units and Individuals to Minimum Operationally Ready/POR Status; SN 7.4 Educate and Train the Force; OP 1.1 Conduct Operational Movement; OP 2.1 Direct Operational Intelligence Activities; OP 3.1 Conduct Joint Force Targeting; OP 4.1 Coordinate Supply of Arms, Munitions, and Equipment in the Joint Operations Area (JOA); OP 5.1 Acquire and Communicate Operational Level Information and Maintain Status; OP 6.1 Provide Operational Air, Space, and Missile Defense; OP 7.2 Coordinate Active CBRNE Defense in the Joint Operations Area (JOA).

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Section XI - Human Engineering

The Soldier is the single most important aspect of the combat power of the Future Force. The Future Force Soldier is a combat Soldier first and foremost. Despite the expected proliferation of unmanned systems, the role Soldiers will have in the future battlespace demands they remain the cornerstone for force design and employment. Soldiers, not equipment, accomplish missions and win wars. In order to achieve revolutionary effectiveness across the full spectrum of conflict, human engineering capabilities will enable the Future Force to:

- Decrease task complexity and execution times to improve performance while minimizing sensory, cognitive, and physically demands on the Soldier.

- Systems that have been human engineered to improve Soldier trainability.

4-71. Joint/Army Concept Linkage. While there are no concepts that Human Engineering is directly linked to, it is indirectly linked to all concepts and proposed capabilities. The Soldier-system interface is a critical consideration in all capability developments. If the system does not enhance or improve Soldier performance, its utility is suspect.

4-72. Desired Human Engineering Capabilities. Desired capabilities for the Human Engineering FOC area are combined in the following area:

- Human Engineering for the Soldier.
- Trainability.

4-73. FOC 11-01: <u>Human Engineering for the Soldier</u>. Regardless of the importance of equipment, or the expansion of technological capabilities, Soldiers are more important than machines. Soldiers, not equipment, accomplish missions and win wars. They continue to be the centerpiece of the Future Force. In order to achieve revolutionary effectiveness across the full spectrum of conflict, human engineering capabilities will enable the Future Force to:

- Reduce Soldier dismounted movement approach load to no more than 40 pounds. Reduce dismounted Soldier's fighting load to 15 pounds.
- Decrease task complexity and execution times to improve performance, while minimizing sensory, cognitive, and physical demands on the Soldier.
- Provide mobility enhancements to reduce Soldier workload through environmental ride quality and task automation .
- Exploit unmanned technology in manned systems, to enhance continuous 24-7 operations.

   a. Capstone Capabilities. Soldiers are the enduring hallmark of the Army. To achieve revolutionary effectiveness across the full spectrum of conflict, the Future Force will consist of high quality, multifunctional Soldiers, supported by state-of-the-art weapons and equipment, to engage BLOS, dominate close combat, and ultimately seize and control an objective, on any terrain, anywhere in the world, and an exceptional quality of life for their families. The U.S. Soldier will stand as the premier warfighter, capable of effectively employing digitized, computer-based planning, decision, combat, communication, and service support aids, to overwhelm the enemy in any battlespace condition. The Army seeks to optimize the mutual operational benefits of Soldiers enabled by systems, and systems enabled by Soldiers.

   b. Narrative.

      (1) The warrior Soldier is the single most important aspect of the Future Force combat power. The Future Force Soldier is a combat Soldier first and foremost. Despite the expected proliferation of unmanned systems, the significant role that Soldiers will have in the future battlespace demands that they remain the cornerstone for force design and employment. Technology is merely a tool to be utilized by a thinking Soldier, to enhance human characteristics such as common sense, battlefield instinct, and the warrior ethos. Soldiers must react to issues of morality, and exercise mature judgment, while decisively wielding highly lethal weapons in the demanding, chaotic environment of war.

      (2) The need for Soldiers to close with the enemy, by fire and maneuver, remains a critical requirement for the Future Force, regardless of the introduction of advanced technologies and the desire for sterile long-range precision warfare. Only a ground force can deny the enemy the option to pursue a protracted stalemate, and only the Soldier can effectively control populations, and take terrain. This is especially true for operations in urban and complex terrain, which many military experts believe to be the most likely battlefield of the future. Additionally, the nature of the environment, and the ROE, may limit other options available to the commander. For the foreseeable future—as throughout all of the recorded history of warfare—a Soldier on the ground, winning the close fight, is our defining capability, and an indispensable resource for the nation.

      (3) The Future Force Soldier will experience a paradigm shift from a linear, contiguous battlefield, to a more distributed noncontiguous, nonlinear battlefield. Transitions from peace, to deployment, to warfighting, will be compressed. Psychological preparedness will be as important as physical and cognitive preparedness for contingency deployments. Future Force Soldiers must exercise judgment and initiative under stressful circumstances, and be capable of learning and adapting to the demands of full spectrum operations.

      (4) The Army must aggressively recruit and retain high quality individuals who can meet the training and operational demands required in information age warfare. Both officer and enlisted recruits must possess a strong aptitude for computer-based learning, and must be comfortable working with advanced computer-based technologies. All Soldiers—not only leaders—must have the ability to make rapid decisions, while under stresses normally not realized by present day personnel. They must demonstrate an above average maturity level, as these individuals will have access to more firepower and lethality than did their predecessors in

history. Future Force leaders and Soldiers must clearly demonstrate the ability to handle that responsibility.

(5) To retain those Soldiers, the Army must address the changing expectations of our more diverse and educated Army in 3 critical areas: how Soldiers and their families live; where Soldiers and their families live; and where Soldiers and civilians work. (See FOC-08-04: Installations as Flagships).

(6) On the multidimensional battlefield, the Soldier will require near absolute situational awareness. Soldiers will need to be fully integrated into the battlefield information flow with their C4I suite. This capability will permit the Soldier to positively know their own location, the location of team members, and the location of other friendly forces (e.g., resupply points, casualty collection point (CCP), coalition forces, etc.), enemy locations, and noncombatants. Soldiers must have the ability to physically 'see' the battlefield with great fidelity in all light, weather, and temperature conditions, as well as manmade obscuration, and to rapidly transition across these varied conditions.

(7) Future Soldiers will have a microcomputer capability that is small, lightweight, powerful, voice-activated and responsive, and will facilitate the Soldiers' ability to push/pull information from the GIG. Unlike the systems of today, this system will not have 'visible' reception and transmitting devices (e.g., antennas, etc.), reducing the enemy's ability to discern the location of key leaders/personnel. The ability of the Soldier to communicate must be unencumbered by terrain, manmade structures and other influences (to include subterranean), units equipped with Current systems, and languages. The system will feature a two-way translation device, an earpiece for improved listening, and 'whisper microphone' capability for improved verbal communications, reducing battlefield confusion, and the possibility of enemy detection.

(8) The placement of advanced and fused sensors will also contribute to improving battlefield awareness. These sensors will provide the Soldier with the ability to 'see' through obstacles, e.g., buildings and complex terrain. These sensors will be deployed through the employment of a wide array of manned/unmanned ground, aerial, and space platforms, as well as robotics.

(9) Additionally, robotics and UGVs will provide greater Soldier standoff during operations that are inherently close quarters in nature, such as operations in urban and complex terrain. Augmented with a wide array of 'tools', unmanned systems can assist with obstacle/structure breaching, providing the Soldier with improved mobility. Unmanned systems will also provide the Soldier with the ability to avoid/detect hazardous areas like minefields, subterranean passages, and contaminated areas. These systems will be value-added for security operations; filling gaps, and providing early warning/detection, will assist with force conservation—the ability to do more with the same size force. Additionally, unmanned systems can support by carrying gear and conducting resupply operations.

(10) Future Soldiers will have the capability to directly command remote precision fire support, without compromising their location. Soldiers will have the ability to 'call for fire'

from a wide array of autonomous, semiautonomous, and manned fire support platforms. This capability will extend to close air support as well. Although more restrictive, Soldiers and air platforms (manned and unmanned) will have improved interoperability, which will allow them to work closely with regard to target identification and interdiction. This teaming will improve 'Soldier lethality' at greater target standoff, and enhance system survivability for the aerial platform.

(11) The Future Force Soldier will employ advanced individual and crew-served weapons with LOS and bursting munitions capabilities. These lethal capabilities will allow the Soldier to rapidly suppress and kill enemy forces, engage and defeat light armored vehicles, defeat/reduce 'light' obstacles, and facilitate greater standoff, while breaching larger structures during operations in urban and complex terrain.

(12) The Future Force Soldier will have the ability to employ a wide array of lethal and nonlethal munitions, based upon mission need, FP, and ROE. Nonlethal munitions will include antimaterial, chemical, electromagnetic, obscurants, DE, thermal, marking, acoustic, incapacitating electric, kinetic, optical, and informational. This nonlethal capability will be essential for improved situational awareness, FP, limiting collateral damage, and reducing noncombatant and friendly force deaths, especially during operations in urban and complex terrain.

(13) Soldiers will utilize unmanned vehicles, robotics, and advanced (standoff) recovery equipment to 'recover' wounded and injured Soldiers from high-risk areas, with minimal exposure. These systems will also be utilized to evacuate the wounded/injured under extremely hazardous conditions.

(14) Future Soldiers will need a light, non-bulky 'smart' uniform/suit/ensemble that will provide a 'chameleon-like' camouflage capability, and physical and respiratory protection from ballistic threats, chemical and biological agents, as well as environmental effects (heat, cold, wind, rain, snow). The suit will provide protection from those hazards normally associated with the urban environment, (e.g., glass, rubble, steel shards, etc.), and will be durable enough to withstand the demands of close quarters combat operations in urban and complex terrain. The flexible, full spectrum protection offered by the suit will allow the Soldier to adapt to dynamic threats. If exposed to chemical, biological, or TIM, the suit will have the ability to detoxify itself. It will also provide signature reduction from a variety of enemy detection systems.

(15) The Future Force Soldier will require superior mobility capabilities. Advanced 'all condition' optical devices will allow movement on the battlefield under the most extreme conditions. The Soldier's assured link to the GIG will enable navigation through the most restrictive terrain, including surface and subterranean corridors. The Soldier's weapon systems and links to fires/effects and MS platforms will aid the in-stride reduction of obstacles, allowing the Force to maintain momentum, significantly reducing the possibility of becoming decisively engaged by the enemy. Access to individual lift systems will aid in reaching upper levels of urban structures, bypass manmade and natural obstacles, and quickly negotiate restricted areas of the battlefield. Additionally, the Soldier will utilize precision airdrop to facilitate rapid entry operations.

c. Linkage to AUTL: ART 7.7 (Support the Commander's Leadership Responsibilities for Morale, Welfare, and Discipline); ART 7.8 (Conduct Continuous Operations).

d. Linkage to UJTL: No UJTL task is specific to the topic of Human Engineering.

4-74. FOC-11-02: Man-Machine Interface.

a. Capstone Capabilities.

(1) Effective man-machine interface and human engineering will be essential, in order for Future Force Soldiers to operate new equipment quickly, easily, and effectively, with only the minimum essential new equipment training (NET), sustainment training, experience, or reliance on mentoring or performance support systems. The direct benefit to the FF will be the reduction of Soldier and unit operational 'down-time' due to extended NET requirements. By embedding performance support systems into equipment from the onset, the Army will further reduce the negative impact of increased cognitive demands placed upon leaders and Soldiers by concepts like 'multi-skilling'; the capability to perform a wider range of tasks than today's Soldiers; and adaptability, the ability to apply their skills in a wide range of operations. Increases in skill demands must be fully considered in Future Force weapons/equipment system design, to ensure optimal Soldier and equipment performance. The following capabilities are essential to achieving the capstone capability for trainability:

- New equipment systems that are human engineered.
- Ability to forecast the impacts of DOTMLPF changes and the OE, alone or in combination, on Soldier performance and training.

b. Narrative.

(1) The Future Force must have the capability to provide Soldiers *new equipment systems that have* been human-engineered, to optimize both Soldier performance, and the ease of training and sustaining equipment-related skills. All aspects of the system-of-systems must be easy to learn, user friendly, preclude catastrophic mistakes, and facilitate operational competence. System-of-systems must support adaptive training, enabling team proficiency with a common set of operational user interfaces, (look, feel, and function). A formal and accountable 'Usability Engineering' process must be rigorously and systematically incorporated into the system-of-systems developmental process. This capability must ensure that Soldiers can operate equipment reliably and effectively, under high workload and other high stress conditions, when Future Force performance demands will be greatest. Additionally, the training construct itself must be validated through user trials during the acquisition process, simultaneously engineering functionally sound and reliable training systems to accompany equipment systems.

(2) The design and development of effective training and training support for the Future Force will depend in part on our ability to understand and *forecast the impacts on Soldier performance of Future Force DOTMLPF changes* (such as new equipment, new organizational designs, and new personnel concepts) while also factoring in impacts of the Future Force OE.

We must have the capability to understand the individual impacts of DOTMLPF changes on training, but it will be equally important to understand the combined impacts of changes in two or more DOTMLPF domains, which often happen simultaneously in transition to the Future Force. Tools and procedures to improve our ability to identify changing demands on Soldier performance, and translate those into training needs, will support the conduct of Future Force training impact analysis and Manpower, Personnel, and Training Analysis on Future Force systems.

     (3) The Future Force must also have the capability to provide Soldiers distributed technical assistance (e.g., electronic performance support systems) to achieve and maintain readiness on mission essential tasks, while minimizing reliance on training. This capability must enable Soldiers to effectively and efficiently use and/or maintain equipment. This capability must also assist multi-skilled Soldiers to perform mission essential tasks that are inherently difficult, complex, and/or multi-step, performed infrequently, or have not been previously performed.

  c. Linkage to AUTL: ART 7.7.3 (Train Subordinates and Units).

  d. Linkage to UJTL: SN 4.1.2 (Procure, Train, Supply, Transport, and Maintain Personnel); ST 4.2.4 (Establish and Coordinate Training of Joint and Combined Forces and Conditions/Standards); SN 3.1.4 (Coordinate Joint/Multinational Training Events); SN 6.3.2 (Conduct Specified Training); SN 6.5.4 (Train Units and Individuals to Minimum Operationally Ready/POR Status); SN 7.4 (Educate and Train the Force).

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Appendix A
References

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Objective Force Unit of Employment Concept

TRADOC Pamphlet 525-4-0
Maneuver Sustainment Operations for the Future Force

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Appendix B
FOC Format

FOC are formatted as outlined below:

    a. Force Operating Capability Identifier: Alphanumeric designator and title of the FOC.

    b. Description of [the] Force Operating Capability. (No more than 10 bullets)

    c. Capstone capability overview: Describes the intended capability's end state if fully attained. Describes how the particular capability significantly empowers the force in concise operational terms.

    d. Narrative: Substantive description of the operational background, conceptual rationale, scope and warfighting impact of the required capability.

    e. AUTL/UJTL Linkage: Linkages to Army Universal Task List (AUTL) contained in FM 7-15 (currently in draft) and the Universal Joint Task List (UJTL) contained in Chairman of the Joint Chiefs of Staff (CJCS) Manual (CJCSM) 3500.04C.

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Glossary

Section I
Abbreviations

AAR	After Action Review
AIEP	Army Idea for Excellence Program
AO	area of operations
AMD	Air and Missile Defense
AP	antipersonnel
APOD	aerial port of debarkation
AR	army regulation
ARFOR	Army Forces
ART	Article
ASTMP	Army Science and Technology Master Plan
AT	antitank

ATCP	Army Transformation Campaign Plan
ATD	Advanced Technology Demonstration
ATGM	antitank guided missile
ATO	Army Technology Objectives
AUTL	Army Universal Task List
BA	Battlespace Awareness
BCC	battle command construct
BCS	battle command system
BDA	battle damage assessment
BFA	battlefield functional area
BLOS	beyond line of sight
C2	command and control
C3	command, control, and communications
C4	command, control, communications and computers
C4I	command, control, communications, computers and intelligence
C4ISR	command, control, communications, computers, intelligence, surveillance and reconnaissance
CA	civil affairs
CBRN	chemical, biological, radiological, nuclear
CCD	cover, concealment, and deception
CCP	casualty collection point
CE	chemical energy
CGF	computer generated forces
CID	combat identification
CI	civilian internee
CI	counter intelligence
CIFFN	combat identification friend-, foe-, neutral
CIM	Civil Information Management
CJCS	Chairman of the Joint Chiefs of Staff
CJCSM	Chairman of the Joint Chiefs Manual
CNA	computer network attack
CND	computer network defense
CMOC	civil military operations center
COA	course of action
COMSEC	communications security
CONUS	continental United States
COP	common operational picture
COSC	combat/operational stress control
CP	command post
CPR	cardiopulmonary resuscitation
CRAF	Civil Reserve Air Fleet
CRD	Capstone Requirements Document
CRT	combat repair team
CROP	common relevant operating picture
CS	combat support
CSS	combat service support

CTC	combat training center
DA	Department of the Army
DCSDEV	Deputy Chief of Staff for Developments
DE	directed energy
DNBI	disease and nonbattle injury
DoD	Department of Defense
DOTMLPF	Doctrine, Organization, Training, Materiel, Leader Development, Personnel, and Facilities
DST	decision support tools
DTS	Defense Transportation System
EMP	electromagnetic pulse
EMPRS	En Route Mission Planning and Rehearsal System
EO	electro-optical
EPW	enemy prisoner of war
ET	embedded training
EW	electronic warfare
FBCB2	FXXI Battle Command for Brigade and Below
FCS	future combat system
FFW	Future Force Warrior
FHP	Force Health Protection
FOB	forward operating base
FOC	Force Operating Capability
FP	force protection
FoS	family of systems
FM	field manual
GFE	government furnished equipment
GIG	Global Information Grid
HQ	headquarters
HPT	High Payoff Target
HS	hyper-spectral
HSOC	home station operation center
HUMINT	human intelligence
IA	information assurance
IAW	in accordance with
IED	improvised explosive device
IER	information exchange requirement
IETM	Interactive Electronic Technical Manuals
IFF	identification of friend or foe
IM	information management
INFOSEC	information security
INFOSYS	information systems
IO	information operations
IPB	intelligence preparation of the battlefield
IPI	indigenous populations and institutions
IR	infrared
IS	information dominance

ISB	intermediate staging base
ISR	intelligence, surveillance, and reconnaissance
ISR/TA	intelligence, surveillance, and reconnaissance / target acquisition
IT	information technology
JFC	Joint Force Commander
JFCOM	Joint Forces Command
JFLCC	Joint Force Land Component Command
JIIM	Joint, Interagency, Intergovernmental and Multinational
JIM	Joint Improvements and Modernization
JLOTS	Joint Logistics Over The Shore
JOA	joint operational area
JOC	Joint Operating Concepts
JOpsC	Joint Operational Concept
JTF	Joint Task Force
JTRS	Joint Tactical Radio System
KE	kinetic energy
km	kilometers
kph	kilometers per hour
LOC	line of communications
LOS	line-of-sight
LRM	Line Replacement Module
LRU	Line Replacement Unit
MCO	major combat operations
MEDEVAC	medical evacuation
MEV	medical evacuation vehicle
MHE	materials handling equipment
MIT	moving target indicator
mm	millimeter
MMH/OH	maintenance man-hours / operating hours
MOG	maximum (aircraft) on ground
MP	military police
MTV	medical treatment vehicle
MS	maneuver support; multi-spectral
MTBSA	Mean Time Between System Abort
MTBSA-M	Mean Time Between System Abort-Mobility
MTBEFF	Mean Time Between Essential Function Failure
NATO	North Atlantic Treaty Organization
NBC	nuclear, biological, and chemical
NET	new equipment training
NLOS	non-line of sight
NLOS LS	NLOS Launch System (networked fires)
NGO	nongovernmental organization
NLOS	non-line of sight
OEH	occupational and environmental health
OGA	other government agencies
OP	operational task

OPSEC	operations security
OPTEMPO	operational tempo
PA	public affairs
P&E	power and energy
PKI	public key infrastructure
PME	professional military education
POD	point of debarkation
POE	point of embarkation
POL	petroleum, oil and lubricants
PSYOP	psychological operations
R&D	research and development
RC	reserve component
RF	radio frequency
ROE	rules of engagement
RSC3	Religious Support Command, Coordination and Communication Center
RSTA	reconnaissance, surveillance and target acquisition
RSOI	reception, staging, onward movement, and integration
RTD	return to duty
S&T	science and technology
SA	situational awareness
SAR	synthetic aperture radar
SASO	stability and support operations
SHORAD	Short-Range Air Defense
SIO	special information operations
SN	strategic national
SOF	Special Operations Forces
SPOD	sea port of debarkation
SSC	small-scaled contingency
SSTOL	super short take-off and landing
ST	strategic theater
STOL	short take-off and landing
SU	situational understanding
TA	tactical task
TAA	tactical assembly area
TAMD	Theater Air and Missile Defense
TEP	tactical electric power
TIC	toxic industrial chemicals
TIM	toxic industrial material
TPFDD	time-phased force and deployment data
TRADOC	(U.S. Army) Training and Doctrine Command
TSP	Training Support Package
TTP	tactics, techniques, and procedures
UA	Unit of Action
UAV	unmanned aerial vehicle
UE	Unit of Employment
UGV	Unmanned Ground Vehicle

UJTL	Universal Joint Task List
UMT	unit ministry team
UXO	unexploded ordnance
VTOL	vertical take-off and landing
WIN-T	Warfighter Information Network-Tactical
WMD	weapons of mass destruction
WME	weapons of mass effect

Section II
Terms

Global Information Grid
A globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information, on demand, to warfighters, policy makers, and support personnel.

reach or reach-back
The application of communications and/or computer connectivity from a commander, staff, or unit to rapidly obtain a service or capability located at a distance. The service or capability may be information, analysis, a staff product, fires, maneuver support capability, or maneuver sustainment capability. The availability of the service or capability by reach obviates the need for the commander, staff, or unit to physically carry this capability on the battlefield, thereby reducing its organizational footprint

See First
See/sense the entire environment before and more clearly than the enemy, while countering the enemy's ability to do the same; the network of integrated manned and unmanned sensors, at all points of the battlefield, from tactical through operational and strategic levels.

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